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PAPER TRADE JOURNAL

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August 16, 1945

Canadian Forest Conservation Drive Starts

Four-Day Meeting of 4-H Clubs Called Greatest Stimulus For Protection of Forest Resources Ever Held In Montreal — Mill Donates Bursaries — Building Paper Mill Opens — Other Mill News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., August 13, 1945—What has been described as the greatest forest conservation campaign Montreal has experienced occurred during the past week through the holding here of the annual four-day convention of 4-H Clubs of the Province of Quebec. It was attended by 450 teen-age delegates from all parts of the province who, at the conclusion, went back to their homes literally in a daze at what they had seen in the metropolis and the way they had been welcomed in Montreal.

The program for their entertainment was one of the most lavish ever prepared for the delegates of a convention in the city. Many of the leading industrial and commercial firms in the province, as well as representatives of the federal and provincial governments and civic bodies, helped to sponsor the program, which included special breakfasts, luncheons and banquets, entertainments, sight-seeing tours, distributions of scholarships, bursaries and special prizes, addresses on conservation, motion picture films, and special exhibitions, all centering around the theme of forest conservation and rural betterment, and all designed to inspire and enthuse the delegates in the study of problems which in ten or twenty years from now they will likely be called upon to solve.

Leading spirit of the convention was Dr. A. R. Gobeil. The movement was organized in 1942 by the Quebec Forestry Association, and resulted from a study of the 4-H Clubs in the United States, a youth movement which Dr. Gobeil says has attained unequalled success, there being over 2,000,000 members in the U. S. 4-H Clubs. They are doing a tremendous amount of work to improve living conditions in rural districts. The policies of these clubs, he says, are decided by the Federal Department of Agriculture and the American agricultural colleges, which in turn transmit them to the clubs of the various States.

The Quebec 4-H Clubs are very similar to the ones in the United States; in fact, it is frankly admitted that the Quebec movement has borrowed their name and many of their methods and also their inspiration, which is to interest boys and girls to do all they can to preserve our natural resources and thus insure our future wealth.

The first Club in the Province of Quebec was founded in 1942 at Val Brillant, and the movement has rapidly spread. Today there are 45 Clubs in the province, with a total membership of 2,500, and, prior to the Montreal convention, two annual conventions had been held, one at Rimouski and one at Duchesny. It is hoped that eventually every single community in the province will have two clubs, one for boys and one for girls.

In view of the use made of the American example, it is interesting to note that one of the speakers at the convention was Miss G. Warren, representing the U. S. Federal Department of Agriculture. She pointed out that there are now 4-H Clubs in England, in several European countries, and in a number of the South Pacific islands. "I am convinced," she said, "that 4-H Clubs will tend to establish more cordial relations between the United States and Canada. For the past quarter of a century U. S. 4-H Clubs have helped the promotion of agriculture and the organization of youth movements in rural districts."

A feature of the proceedings was in connection with the election of officers for the ensuing year. Several candidates for the higher offices conducted a typical political campaign overnight. Winners of scholarship and other prizes were announced as follows:

Electricity, $200 donated by the Shawinigan Water & Power Company, Yvon Dube, Cabano; forestry safety, $200, by the Canadian Lumberman's Association, Roger Chenier, Maniwaki; forest protection, $200 by Watson, Jack and Company, Limited, Antonio Dube, Cabano; fish and game, $200, by Marine Industries, Limited, Leo Brossard, Chicoutimi; literature, three scholarships donated by La Presse $50 to Claude Reinhardt, Cap St. Ignace, $30 to Yvon Dube of Cabano, and $20 to Rene Brisson, Ste. Foye East; reforestation, Quebec Forest Industries Association, $200 to the Ste. Agathe des Monts Club; realization, two of $200 each, donated by International Harvester Company. Miss Helene Poirier, Maniwaki, and Paul Brulotte, Lac Megantic; initiative, two trips to Chicago, offered by the Quebec North Shore Paper Company, Rita Lefebvre, Chandler and Norman Laferriere, Berthier; organization of clubs, Imperial Oil Company, two $100 scholarships to the Lac Megantic and Cabano clubs; special prizes, Quebec Forestry Association, $50 to the Riviere du Loup Club; handicrafts, T. Eaton Company, $200 to Maurice Poquet, $50 to Ovide Blackburn, $25 to Marcel Lessard.

Pulp Company Donates Bursaries

Dr. W. P. Percival, director of Protestant Education for the Province of Quebec, has announced the winners of bursaries offered during the school year 1944-45 by the Gaspesia Sulphite Company, of Chandler, Que., through its president and general manager, E. M. Little, to boys in Protestant and Catholic

(Continued on page 22)

Consolidated to Expand Wisconsin Mill

Recently Purchased Property Now Provides Consolidated Water Power & Paper Co. With Five Pulp and Paper Plants—Nekoosa-Edwards Starts Work On Filter Plant — Other Industrial News.

APPLETON, Wis., Aug. 13—Consolidated Water Power and Paper Company, with headquarters at Wisconsin Rapids, which acquired on Aug. 1 all physical property and power resources of the Wisconsin River Paper and Pulp company at Stevens Point, Wis., has disclosed plans to enlarge the newly purchased mill and convert it to the manufacture of coated paper. With this addition to the Consolidated holdings, the firm now operates five pulp and paper mills including the home plant at Wisconsin Rapids, a second mill at Biron, a Mitscherlich sulphite mill at Appleton, a plant in Stevens Point and the newly acquired mill at Appleton, a plant in Stevens Point and the newly acquired mill which has been designated as the Wisconsin River division.

The plant recently purchased is a 70-ton newsprint mill. A sizable program already is in progress, however, which will convert the two paper machines to coated grades, using Consolidated's patented method of coating preparation and application. Excavation work began last week on land adjoining the mill.

The two machines will have a daily capacity of 100 tons and will be in shape to make the new grade soon after the first of the year, according to company officials. Until alterations are completed, all existing newsprint contracts will be fulfilled.

Structural alterations and additions will include a building 370 feet in length to contain the new coating preparation plant, storage of raw materials, clock-house, rest rooms and office. The building will be located east of the present mill proper and will be joined to the main plant by a roof and end walls to enclose and shelter 14 freight cars.

The present finishing room will be strengthened and improved by the installation of steel fabricated ceiling supports, and new concrete flooring will be provided. Two new super calenders will be installed. Engineering plans also include motors for a portion of the grinders. Bleached sulphite will be shipped from the company's Appleton division. C. R. Morse is retained as mill manager, it was announced, and there are no plans for any change in personnel.

Edgewater Co. to Erect Addition

Ground was broken last week to begin work on a new concrete-brick 2-story addition to the Edgewater Paper Company at Menasha, Wis. The general construction contract for the addition, which will be 60 by 75 feet, has been awarded to Fluor Brothers Construction company of Oshkosh and work on the structure, together with a concrete shipping platform, 15 by 150 feet, probably will be completed within three months. The addition will be attached to Edgewater's north building, will be used for manufacturing and will increase the firm's manufacturing space about 30 per cent. Machines will be transferred to the new structure and the old north building will be retained for use as a warehouse.

Valley Contributes Atomic Bomb Parts

The Valley Iron Works Company of Appleton, Wis., long known to paper and allied industries, was one of 37 Wisconsin firms that had a part in making parts and equipment for the atomic bombs dropped on Japan.

R. A. Peterson, president of the company, said last week that "While details cannot be given, it can be stated that an Appleton company played an important part as a prime contractor in the production of equipment providing energy for the atomic bomb."

The largest contributor to the bomb making equipment was the Allis Chalmers Manufacturing Company of Milwaukee.

Nekoosa-Edwards Starts Filter Plant

Excavation has been completed for a new $85,000 filter plant at the Nekoosa-Edwards Paper company, Nekoosa and Port Edwards, Wis. The building will be located at the southeast corner of the hydro-electric plant, between the dam spillway and the tail race. Forms for pouring footings for the walls and supports have been set. The plant will supply filtered Nepco lake water for the new bleach plant on which construction has begun.

Kimberly-Clark Workers on Outing

More than 1,000 employes and their families of Kimberly-Clark Corporation, Neenah, Wis., attended their annual picnic Aug. 6 at Riverside park, Neenah. The picnic had been planned for the preceding day but bad weather forced postponement of much of the scheduled program until the following day. Bill Chopin was general chairman and his assistants included Rudy Fredericks, Betty Heebink, Bob Wood, Harold Koerwitz, Phil Lewis, Elmer Sievert, Ken Bisel, Kenneth Hatch, George Fickle, Ernie Johansson, Kenneth Wallace, Peter Rohe, Charles Hanson, Jerry Verstegen, Carl Gerlach, Wallace Sell, Fred Bentzen and Walter Johnson.

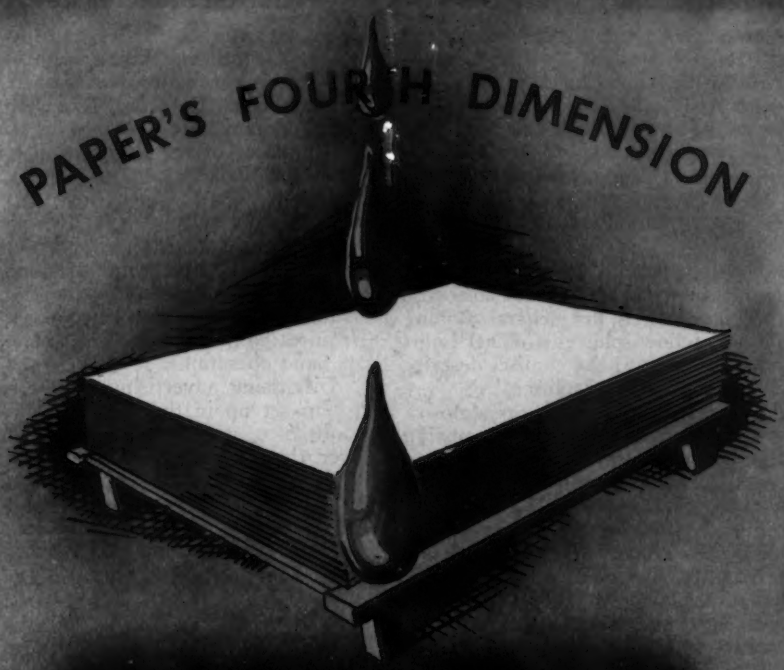
Nekoosa-Edwards to Award Harvest Prizes

Plans for the third annual harvest festival at the John Edwards High school auditorium in Port Edwards Sept. 8 were made at a meeting at the Nekoosa-Edwards Paper Company last week.

The firm will award 350 prizes for the best vegetables, canned goods and flowers. Nepco trucks will furnish transportation from Nekoosa. Church organizations from both communities have been asked to assist. Assisting Chairman W. R. Cahill will be Lee Turley, C. E. Treleven, Richard Tracy, Frank Gaetke, Leslie Eichsteadt, Mrs. John E. Alexander, J. K. Vanatta and F. G. Kilp.

Appleton Paper Salvage High

The monthly waste paper collection in Appleton, Wis., Aug. 9 netted 44,910 pounds, second only to the record June pickup of 62 tons and double the July figure of 21,000 pounds. The August pickup was promoted by the Appleton Junior Chamber of Commerce salvage committee. Working with the Outagamie county salvage committee, efforts were made to unify the salvage work under the Appleton Plan for the Recovery of Waste Paper. Benefits from the Appleton paper collections go to the Boy Scout and Girl Scout organizations.



To pre-war standards of paper values, add the sales power of COLOR.

More than a container or protective wrapping, colored paper has codified wartime closures . . . will be a salesman extraordinary in post-war markets.

Many mills, seeking to maintain wartime output, can profit now by revising coloring formulas and methods for peacetime production. Close to new developments in these directions, NATIONAL TECHNICAL SERVICE can help with advice on coloring techniques, stock analyses and color formulas.

This service is yours for the asking.

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BOSTON • PROVIDENCE • PHILADELPHIA • CHICAGO • SAN FRANCISCO • CHARLOTTE
GREENSBORO • ATLANTA • NEW ORLEANS • CHATTANOOGA • PORTLAND, ORE. • TORONTO

Sergt. Craigie Keeps His Tie On

MANNHEIM, Germany, August 9, 1945—Technical Sgt. Hugh A. Craigie, son of George Craigie, Executive Secretary of the American Pulp and Paper Mill Superintendents Assn., was chosen from approximately 17,000 men as the best all-around soldier in the Railsplitter Division, 84th Infantry, 7th Army, it was announced recently. Sgt. Craigie received his title and award from Major General Alexander R. Bolling, division commander at Mannheim Stadium ceremonies.

"I didn't know what it was all about. They just told me to come here with my tie on and hair combed," he said. He was congratulated by General Bolling before more than 6,000 fellow soldiers. Colonel Louis W. Truman, chief of staff, read the citation describing the selection of the "Best Railsplitter."

The 21-year-old soldier has been overseas almost a year, and wears three stars on his ETO campaign ribbon, designating the battle of the Rhine, Ardennes, and the drive across Germany.

His division met the Russians at the Elbe. Craigie also holds the Silver Star for gallantry in action, awarded on June 26; the Presidential Unit Citation, and the Combat Infantry Badge. The 84th was reviewed by President Truman and General Eisenhower at Frankfort, Sgt. Craigie wrote home.

A brother, Lieutenant (jg) George W. Craigie, Jr., USNR, is captain of an LCI in the Pacific.

To Auction Gilman Preferred Shares

Morris Gintzler, Louis S. Lewis and Public National Bank & Trust Co. of New York, as executors of the Isaac Gilman estate, will offer 15,099 preferred shares of Gilman Paper Co. at public auction Aug. 22 at 20 Vesey Street.

The stock represents approximately 60 per cent of the company's preferred stock. With paper mills at Gilman, Vt., and Howland, Me., the company also owns Gilman Electric Light & Power Co. and Kraft Bag Corp. Substantial interests are held in Millett Corp. and St. Mary's Kraft Corp. Activities of the concern include the manufacture of Kraft paper, unbleached sulphate pulp, paper bags and paper yarn. The common stock has exclusive voting rights.

Isaac Gilman, founder of the company, died a year ago, and the present sale represents a liquidation of his holdings in the 3 per cent participating, cumulative preferred stock.

Manistique Appoints Roger Smith

ESCANABA, Mich., July 30, 1945—Roger O. Smith, of Escanaba, has been appointed general superintendent of the Manistique Pulp and Paper Company, succeeding T. F. Mulrooney who resigned recently.

Mr. Smith has been in the employ of the Escanaba Paper company since 1934, serving in various capacities in the different departments of the Escanaba plan. He brings with him a thorough knowledge of the manufacture of groundwood pulp and a technical understanding of the exacting qualities in the production of groundwood paper.

Chilson Moves to Park Avenue

New York offices of Francis Chilson, Industrial Consultant, have been moved to 101 Park Avenue.

A specialist for the chemical, drug, cosmetic, paper, and packaging industries, the Chilson services were formerly at 101 W. 31st Street.

Carton Makers Golf at Rumford

PROVIDENCE, R. I., August 13, 1945—The outing of the Carton Association, with headquarters in this city, was a very enjoyable affair at the Wannamoisett Country Club, Rumford, R. I., August 7. Eighty paper box manufacturers and guests were present, with 18 members of the Association attending. Golf was the sport of the day. At the dinner, President Charles K. Shaw, Shaw Paper Box Co., Pawtucket, R. I., presided.

William R. Kreeger, secretary of the National Paper Box Manufacturers Association, addressed the group, discussing briefly some of the regulations, noting the new amendment No. 6 to MPR-187. which requires box manufacturers to file in regard to speed of hand operations.

Discussing advertising, Mr. Kreeger mentioned a group set up in the industry known as the Master Craftsmen, which had done a good job. Now, however, there is a Public Relations Committee, of which Ralph L. Harden, Mason Paper Box Co., Providence, is chairman. The plan is to raise $50,000 and manufacturers were urged to contribute as soon as possible.

West Virginia Sells Timber

CHARLESTON, S. C., August 13—West Virginia Pulp and Paper Company last week sold for an aggregate price of $4,069,000 the large timber and trees on more than 41,000 acres of its low country holdings to seven lumber and wood products manufacturers. The latter have 11 years to cut the timber.

Informed sources here said the lands are in two irregularly shaped tracts, 4,000 acres in the Wassamassaw swamp section of Berkeley County, and 38,000 acres in Dorchester county, fronting on the Edisto river.

It was pointed out that the lands on which the timber is growing have been owned by West Virginia company for many years. The company decided to sell the timber as part of its long-range harvesting program, it was said, and it is understood the deeds stipulate numerous safeguards to protect the company's investment in present and future timber.

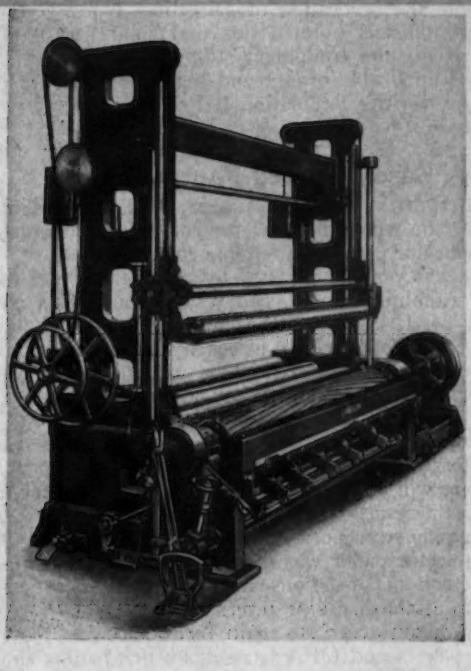
Downing Brown Heads Brown Sales

F. G. Coburn, president of Brown Company, producers of wood cellulose, has announced that Downing P. Brown, who, for some weeks past has been acting temporarily as manager of the sales department, has agreed to continue permanently in the same capacity. Mr. Brown's entire business career has been devoted to the activities of Brown Company, his experience encompassing woods operations, manufacturing and sales. As vice-president in charge of sales, he will continue to be located at the company's general sales offices, 500 Fifth Avenue, New York City.

Flohr Celebrates 25 Years with P & W

William Flohr, Vice-President of Parsons & Whittemore, Inc., met with other long service executives of the company at a luncheon given in his honor at the Hotel Biltmore in New York on Friday, August 3rd, in celebration of his 25 years of service with the company. After commenting on Mr. Flohr's loyal and commendable service, Howard Whittemore, President, presented him with a gold pen and pencil. Joseph Lyddon, Managing Director of Lyddon & Company (London) Ltd. spoke informally of his many contacts with Mr. Flohr.

Successful Combinations



Soap and Water are a "natural"... even though kids shrink from their application.

Another natural and successful combination is that of Langston Slitters and nationally known concerns such as Robert Gair Company, Inc.

Langston Slitters and Roll Winders are noted for reliability and accuracy; for delivering clean, square-cut rolls of proper density.

Wherever paper is processed . . . in mill, finishing room or converting plant, Langston Slitters will give high-quality production with low operating cost.

Type "CA" illustrated, is one of five types built 30" to 263" wide, and up. Speeds, 1500 to 3000 feet per minute.

GAIR

SAMUEL M. LANGSTON COMPANY
CAMDEN, NEW JERSEY

Langston

SLITTERS AND ROLL WINDERS

Rosin Prices Increased

Ceiling prices on gum rosin have been increased 95 cents per hundred pounds, the Office of Price Administration announced today.

The increase applies to both producers and resellers in Amendment 1 to RMPR 561, effective August 15, 1945. OPA said that the increase has been granted on a tentative basis only and is subject to review after a period of from 60 to 90 days in the light of production increases actually resulting. If no appreciable production increase occurs, the price increase may be revoked or revised.

OPA said that a recent survey of producing costs had shown that existing ceilings were well above the minimum required by the Price Control Act. On the basis of that study, informal requests from producers and dealers for higher prices were denied on May 7, 1945.

The Department of Agriculture, which is primarily responsible for the production of gum rosin, has certified to OPA that an increase in the ceiling price of 95 cents per hundred pounds is necessary to accomplish the desired production. That Department is also exercising its powers to encourage production, while the War Production Board has placed rosin under drastic use and inventory restriction and has included it in the critical products list and the national production urgency list.

Not to End Containerboard Order

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., August 8, 1945—In view of uncertainties regarding future military requirements for containerboard, the War Production Board reported today that it is not possible at the present time to revoke Order L-317, governing the manufacture and use of fiber shipping containers.

At a recent joint meeting of the Containerboard and Fiber Box Industry Advisory Committees, revocation of controls governing fiber shipping containers was recommended by committee members. This recommendation was made with the reservation that no changes would be made until it was established that such action would not adversely affect production of containerboard. However, as a result of the recommendation, industry members and fiber box users were under the mistaken impression that immediate revocation of the order would follow.

WPB pointed out that due consideration was given to the advice of the committees, but that upon investigation it was found necessary to retain controls until the military requirements for the fourth quarter have been determined. These requirements will not be formally determined until early in September, and therefore, no action on L-317 can be considered until that time, WPB said.

Obituary

Mills B. Lane

SAVANNAH, Ga., August 6, 1945—Mills B. Lane, aged 85, one of the South's best known bankers and business men, died August 6 at his home following a long illness. One of the first to realize the importance of Dr. Charles H. Herty's experiments in new uses for the pine tree, Mr. Lane and his bank were instrumental in persuading the Union Bag & Paper Corporation to invest heavily here. The deceased is survived by his widow, four sons and one daughter.

Revokes Container Machine Control

WASHINGTON, D. C., August 15, 1945—Direct control over the use of solid fiber shipping container production equipment was relinquished last week by the War Production Board. This action was effected by the revocation of Direction 2 to Conservation Order M-290, originally issued in the spring of 1944 to insure total productive capacity for the manufacture of "V" and "W" boxes, WPB said.

This direction had the desired effect of producing for the war effort all the solid fiber shipping containers required by the armed forces on the limited amount of machinery, which was available in only a few boxshops in the United States.

Now, however, because of changes in government procurement time tables, control of this equipment is no longer needed; capacity is ample, WPB said.

Despite the revocation of Direction 2, WPB Paperboard officials pointed out that solid fiber container production equipment still remains subject to all other applicable orders and regulations of WPB such as Priorities Regulation 1, Priorities Regulation 3 and P-146.

OPA Eases Colored Paper Allowance

WASHINGTON, D. C., August 9, 1945—Ceiling prices at the wholesale level for colored mimeograph and duplicator papers made from coated and uncoated book papers were announced today by the Office of Price Administration. Today's action, effective August 14, 1945, allows the paper merchant to add to his established ceiling prices a color differential equal to the color differential he paid to the manufacturer plus 25 per cent. After adding the mark-up, he may round out the price to the nearest five cents.

Paper merchants sell to printers and converters. Converters make up paper pads, boxes of stationery, etc. There will be no increase in retail prices for these papers as a result of this action, OPA said.

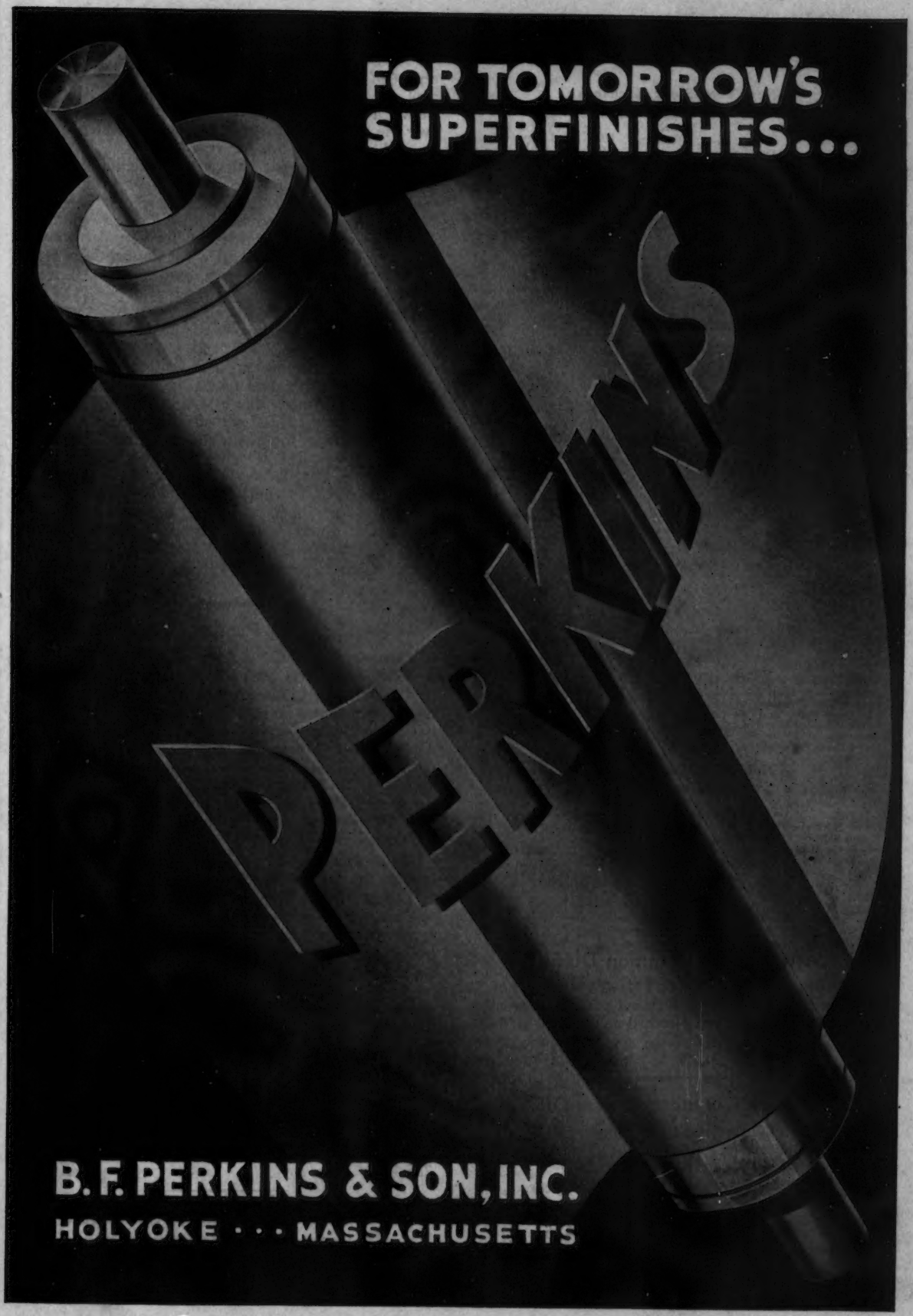
During the war period, little colored mimeograph and duplicator paper was made from coated and uncoated book papers. Consequently, it was not necessary to establish ceiling prices for it.

Now, manufacturers again can produce these colored papers and OPA has set, by this action, the same color differential that the paper merchants used when the papers previously were manufactured.

WPB Increases Wallpaper Quotas

WASHINGTON, D. C., August 7, 1945—Manufacturers of wall paper may increase their annual paper consumption 20 per cent over previous authorizations, or use 20 tons more paper, whichever is greater, the War Production Board announced today. Previously, these manufacturers were permitted to use only 60 per cent of the total tonnage used in their base period, the 1941-1942 season, officials of the WPB Printing and Publishing Division said, explaining that the permitted consumption has been raised to 80 per cent by an amendment to the Wall Paper Limitation Order (L-177) issued today.

Simultaneously, all restrictions on manufacturers using 20 tons or less paper a year were removed. On November 1, 1945, present restrictions affecting sample books and patterns, and the use of certain colors, in printing wall paper will also be removed. Another relaxation was the removal of the requirements that form WPB-3820, calling for certain data on manpower, be furnished when appeals for additional paper tonnage are filed with WPB.


FOR TOMORROW'S
SUPERFINISHES...
PERKINS
B. F. PERKINS & SON, INC.
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FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending August 11, 1945

STOCKS

	High	Low	Last
A. P. W.	6¼	5½	6
Armstrong Cork Co.	45¾	42¾	45½
Celotex Corp.	16⅞	15½	16¼
Celotex Corp., pf.	20⅜	20¼	20¾
Certain-Teed Products Corp.	11⅜	10¾	11¼
Certain-Teed Products Corp., pf.	164	161½	164
Champion Paper & Fibre Co.	35¼	32	34½
Champion Paper & Fibre Co., pf.	...	...	...
Congoleum Nairn Co.	29⅝	28¼	29¾
Container Corp. of America	28¾	27½	28½
Continental-Diamond Fibre Co.	12⅝	11⅜	12½
Crown-Zellerbach Co.	23¼	21¾	22½
Crown-Zellerbach Co., pf.	103¾	103¾	103¾
Dixie Cup Co.	28¼	25¼	28
Dixie Cup Co.—A	48¾	47⅜	47⅝
Flintkote Co.	30	27½	29¾
Flintkote Co., pf.	109	108½	109
Robert Gair	6⅜	5⅜	6¾
Robert Gair, pf.	18	17⅞	17⅞
International Paper Co.	28¼	24	27¾
International Paper Co., pf.	99	96¾	97½
Johns-Manville Corp.	122½	114	122½
Johns-Manville Corp., pf.	...	...	...
Kimberly-Clark Corp.	47½	46½	47½
Mac Andrews & Forbes	31⅜	31⅜	31⅜
Mac Andrews & Forbes, pf.	154	154	154
Masonite Corp.	43¾	41½	43½
Mead Corp.	16	14½	15¾
Mead Corp., pf. A—6%	...	...	...
Mead Corp., pf. B—5½%	103½	103	103
National Container Corp.	15	14¼	14⅝
Paraffine Companies, Inc.	65½	64	65½
Paraffine Companies, Inc., pf.	...	...	...
Rayonier, Inc.	20	18½	19⅞
Rayonier, Inc., pf.	37	36½	36¾
Ruberoid Co.	38	36¾	38
Scott Paper Co.	53½	52¼	52½
Scott Paper Co., pf.	...	...	...
Sutherland Paper Co.	...	...	...
Union Bag & Paper Corp.	18	16⅝	17⅜
United Paperboard Co.	7½	6⅞	7⅛
U. S. Gypsum Co.	91½	88	91½
U. S. Gypsum Co., pf.	190¼	190¼	190¼
West Virginia Pulp & Paper Co.	30	27¾	30
West Virginia Pulp & Paper Co., pf.	110¼	110	110

BONDS

Abitibi Pulp & Paper Co. 5s '53	101⅜	100¾	101⅜
Celotex Corp. 3¾s '55	...	...	...
Certain-Teed Products Corp. 5½s '48	...	...	...
Champion Paper & Fibre Co. 4¾s '50	...	...	...
International Paper Co. 6s '55	108½	108½	108½
International Paper Co. 5s '47	104¾	104¾	104¾
Mead Corp. 3½s '53	...	...	...

New York Curb Exchange

High, Low and Last for Week Ending August 11, 1945

STOCKS

	High	Low	Last
Great Northern Paper Co.	39	37¾	39
Hummel-Ross Fibre Corp.	9	8¼	8¾
St. Regis Paper Co.	7	6⅝	6¾
St. Regis Paper Co., pf.	...	...	...
Taggart Corp.	...	...	...

BONDS

American Writing Paper Co. 6s '61	...	...	...

Warren Votes Common Dividend

BOSTON, Mass., August 6, 1945—A dividend of 50 cents per share has been declared payable September 1, 1945, to the holders of record at the close of business August 18, 1945, of the common stock of the S. D. Warren Company.

Great Northern Profits Off

The Great Northern Paper Company and subsidiaries for the six months to June 30, reports a net profit of $637,164, or 64 cents a share, as against $941,869, equal to 94 cents a share, last year.

A. W. P. Co. Nets $79,435

The American Writing Paper Corporation for the six months to June 30, reports a net profit of $79,435, as against $81,198 in first six months of 1944.

Mersey Co. Issues Report

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., August 13, 1945—The annual report of Mersey Paper Company Limited, of Liverpool, N. S., for the year ending December 31, 1944, shows a further improvement in operating results over the preceding year, which continued the upswing from the low point for the year 1942.

Consolidated gross profits after depletion for year under review amounted to $1,238,812, an improvement of $128,391 over 1943, and comparing with $787,877 for 1942. Coupled with the better operating results was a lower provision for depreciation at $492,705, down from $641,624 for the previous year, with the result that interest charges of $216,735 were covered 3.42 times as compared with interest of $236,940 the preceding period being covered 1.95 times.

Despite a sharp increase of provision for taxes from $84,689 to $207,360, and a charge of $10,826 for bond discount and expenses written off, net profit showed an improvement of $174,899 from $131,286 to $306,185, the latter the best since 1940. Latest net was equivalent to $6.12 per share on the preference shares. Allowing for one year's preferred dividend, the balance equalled 21 cents per share on the common. Net for 1943 worked out to $2.63 per preferred and a deficit of 79 cents per share on the common.

Again no dividends were paid during 1944 on the preference, which is in arrears from July 1, 1938, except for a 3% payment in January 31, 1941. Arrears as of December 31, 1944, totalled $32.75 a share.

Pacific Mills Profits Up for Year

VANCOUVER, B. C., August 13, 1945—Net profit of $918,512 for the year ended April 30 is reported by Pacific Mills, Limited, Ocean Falls and Vancouver, in the company's annual statement. This compares with $731,282 net profit during the previous year. The company is owned by the Crown Zellerbach Company. Dividend payments made during the year amounted to $419,934 comprising the regular dividend of $119,934 or $6 per share on 19,989 preference shares, and $300,000 or $4 per share on the 75,000 ordinary shares.

After providing for preference dividends, net earnings on the ordinary shares equalled $10.65 per share. Net sales during the year ended April 30 were valued at $10,398,361 against $10,269,297 in the same period last year.

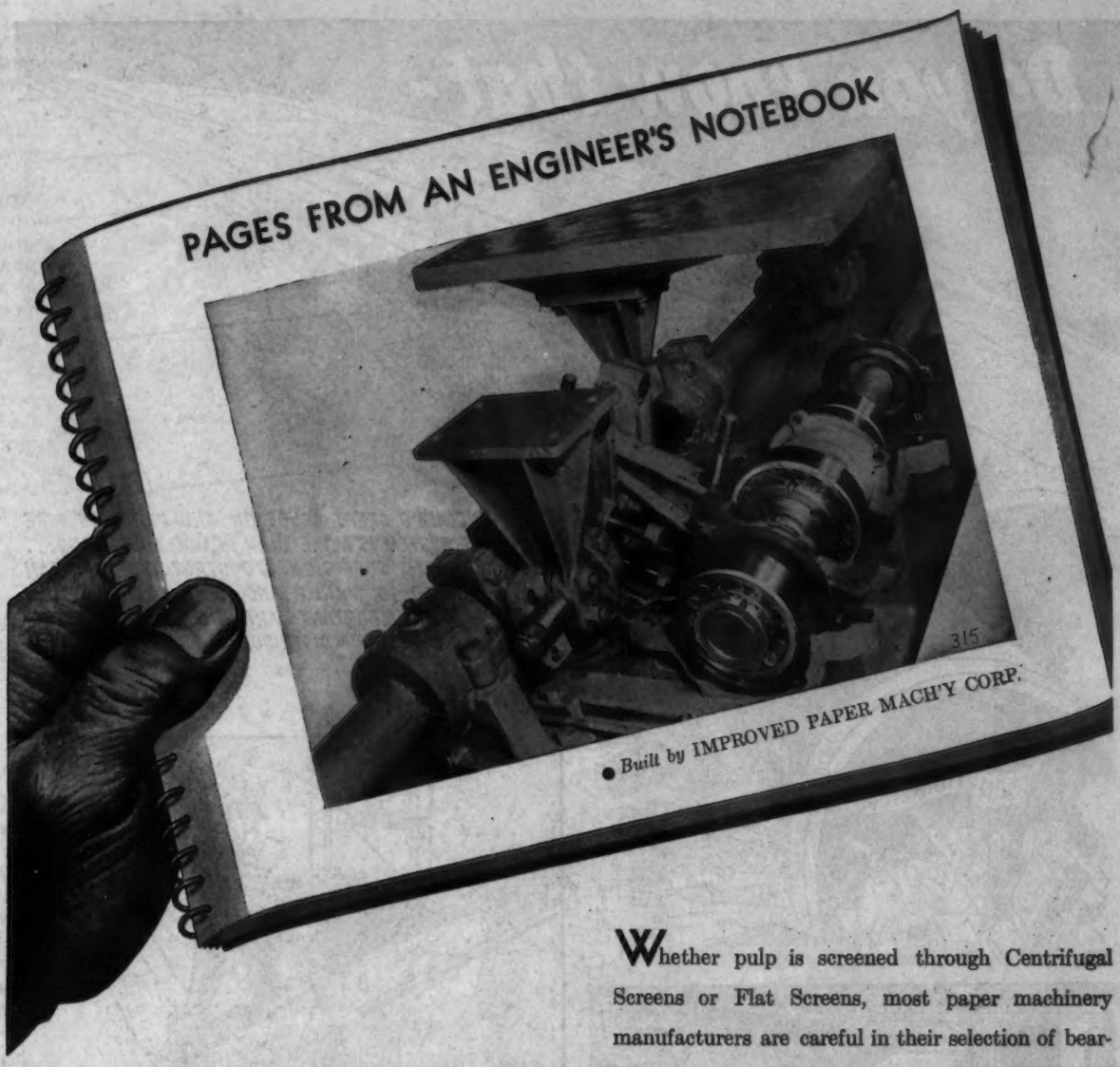
At April 30, 1945, current assets amounted to $5,059,607 or 5.13 times current liabilities of $986,932.. Working capital amounted to $4,072,674 an increase of $241,732 during the year.

Hummel-Ross Nets 20 Cents

The Hummel-Ross Fibre Corporation for the four-week period ending July 14, 1945, reports a net profit of 20 cents per common share, with net sales of $2,945,537, compared with a net profit of 34 cents per common share in 1944, when net sales totaled $3,725,166.

George Burns Buys for Schweitzer

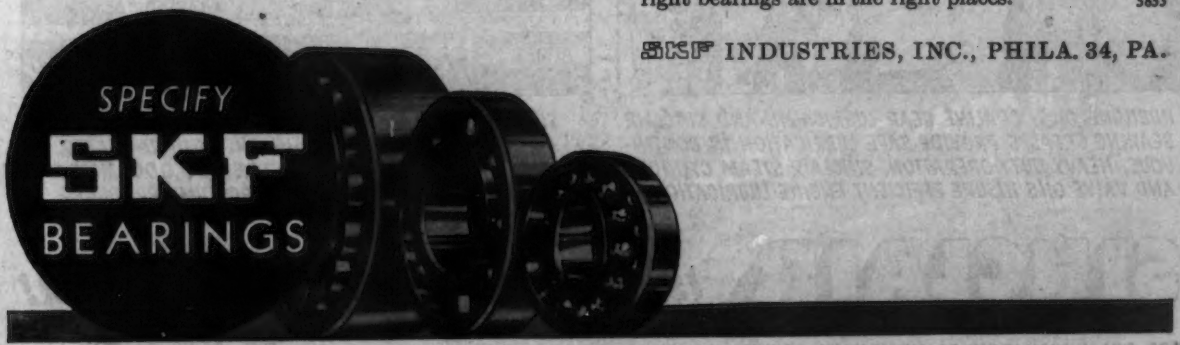
George D. Burns is now in charge of all purchases of paper-making fibers for Peter J. Schweitzer, Inc. Mr. Burns is also in charge of the company's flax operations in the middle west.



FOR FLAT SCREENS OR CENTRIFUGAL SCREENS

Whether pulp is screened through Centrifugal Screens or Flat Screens, most paper machinery manufacturers are careful in their selection of bearings. On this Flat Screen, for instance, SKF Self-Aligning Spherical Roller Bearings are used for an adjustable stroke eccentric to produce the diaphragm motion and for the bearings adjacent to this eccentric to take the reaction. In short, the right bearings are in the right places. 5853

SKF INDUSTRIES, INC., PHILA. 34, PA.



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SINCLAIR'S GREAT CRUDE OIL AND PRODUCTS PIPE LINE SYSTEM IS MORE THAN 14,000 MILES LONG... A LENGTH SUFFICIENT TO STRETCH FROM SAN FRANCISO TO MANILA AND RETURN. THIS SYSTEM PLAYS AN IMPORTANT PART IN SOLVING THE PETROLEUM INDUSTRY'S DISTRIBUTION PROBLEMS.

RUBILENE OILS, OPALINE GEAR LUBRICANTS AND SINCLAIR BEARING GREASES PROVIDE SAFE LUBRICATION IN CONTINUOUS, HEAVY DUTY OPERATION. SINCLAIR STEAM CYLINDER AND VALVE OILS INSURE EFFICIENT ENGINE LUBRICATION.

SINCLAIR OWNS AND OPERATES MORE TANK CARS THAN ANY OTHER OIL COMPANY IN THE UNITED STATES. THEY TRAVEL MORE THAN 325,000,000 MILES ANNUALLY TRANSPORTING PETROLEUM PRODUCTS.

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Paper Making—

A BUSINESS THAT BUILDS BUSINESS

Old in years but young in spirit, the paper industry is an outstanding example of what practical and courageous pioneering can do to build business not only for itself but for other industries as well.

New and improved papers are revolutionizing the packaging of hundreds of products ...improving printing processes...making possible more durable wrappings, tags, maps, blueprints, wall coverings. Everywhere paper is being used in new ways.

Serving the paper industry for more than three decades, Niagara has helped to provide that "Margin of Experience" in which such progress is made.

A pioneering organization itself, Niagara has that "Margin of Experience" that means improved service in electro-chemical products.

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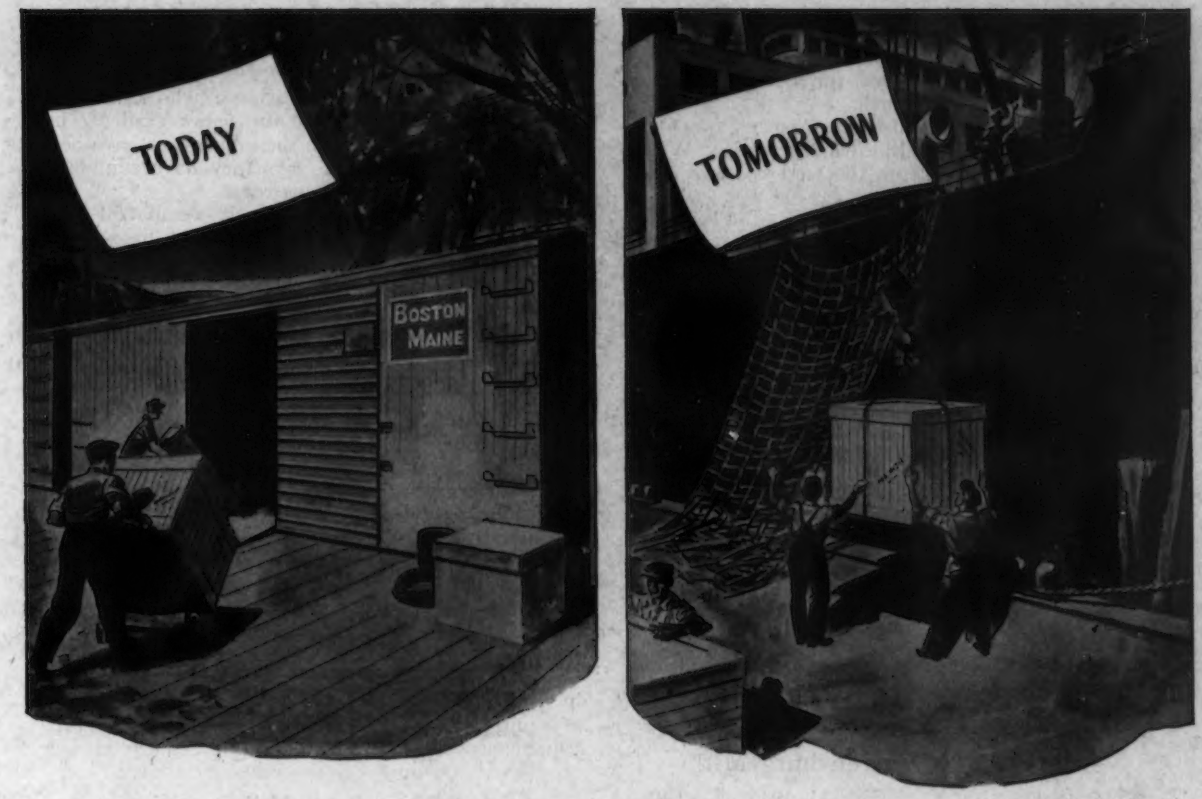


Mr. Traffic Manager . . .

Could you promise delivery ship side tomorrow from your present location? In the postwar scramble for goods—and ocean cargo space—ability to meet sailing dates is going to be important.

If your loading platforms are located in Northern New England, your shipments can be on export docks at Boston or Portland within a matter of hours.

Management will do well to consider a location in Northern New England. Here you'll find unusual advantages—an excellent supply of skilled labor; abundant power and water facilities; uncrowded opportunities for plant expansion; fast, modern transportation; and above all, healthful, pleasant living.

Boston and Maine knows Northern New England. Let us help you decide how important this strategically located area can be to you. Write E. F. Reed, Manager, Industrial Department, Boston and Maine Railroad, Boston 14, Mass.

BOSTON *and* **MAINE**

BOSTON and MAINE RAILROAD

ONE OF AMERICA'S RAILROADS - ALL UNITED FOR VICTORY

Plan Four New Pulp Mills in B. C.

VANCOUVER, B. C., August 13, 1945—Three new pulp mills are now proposed for British Columbia with a possibility of a fourth.

Preliminary work has been in progress for sometime on a new mill for Bloedell, Stewart & Welch, Limited at Port Alberni on the west coast of Vancouver Island.

Howard Simons, well-known Pulp Mill Engineer, formerly of Seattle and Chicago, has now established an office in Vancouver and is at work on the plan for this new Port Alberni mill which it is estimated will have a total production capacity of 160 tons of pulp. Some of the raw material for the mill will come in the form of slabs from the sawmill owned by the company at Port Alberni and from other nearby lumber operations.

At the same time the Powell River Company is making steady progress on its plans for the establishment of a large sulphate mill at Powell River, while W. B. Milner is planning the erection of a new sulphite mill at Giscome.

In connection with the Government development of power resources on Vancouver Island, a non-disclosed company has applied for a block of 8,000 to 10,000 horsepower. This was at first believed to be required for the Port Alberni Mill but it is now hinted that this request came from other interests and if this is correct it would mean the four mills are projected for post-war development in British Columbia.

Will Add to Warrensburg Mill

WARRENSBURG, N. Y., August 11, 1945—The Warrensburg Pulp and Paper Company plans to erect a new paper mill addition following the war which will be used for expansion purposes. A fourth new grinder is now being installed in the plant and plans call for installation of another paper machine and new boilers in the addition.

Since acquiring the mill several years ago, the new owners have done considerable remodeling to the plant and it is claimed that installation of the new machinery will make it among the most modern mills in this section. The new owners operate a branch of mills and it is understood that civilian orders will be plentiful as soon as the war orders are discontinued. M. Baum is president of the company. Full time operations are in effect but there is some difficulty being experienced in obtaining the required help.

Freeland Mill Sold and Reopened

FREELAND, Md., August 14, 1945—E. R. Young has sold the Valley Mill to the Freeland Paper Co., Inc. The mill has started running on bogus wrapping, case lining, and car lining papers, and expects to make imitation kraft in the near future. The mill will specialize in sheets of 40 x 48, and 30 x 40 inch basis 24 x 36—70 to 112 pounds, and rolls 40 inches wide.

Harry K. Williamson is in charge, having been elected vice-president and general manager. Resolute Paper Products Corp. of 1450 Broadway, New York City has been appointed selling agents for the mill.

Ryan Forms Bagprint Machinery Co.

ROYAL OAK, Mich., August 14, 1945—Walter S. Ryan has dissolved the Nagel-Ryan Manufacturing Co. and organized the Bagprint Machinery Corporation for the manufacture and distribution of flat and square bag machines and aniline printing presses.

CANADA STARTS CONSERVATION DRIVE

(Continued from page 9)

schools from Matapedia to Gaspe who came first in the June examinations in the senior grades. This is the second year in which these bursaries have been offered, and Dr. Percival says they have stimulated interest of boys in the Gaspe coast.

The three winners of bursaries, worth $50 each, are: Grade IX, Gaspe Bay South Intermediate School (Gaspe Bay South, Gaspe Village, Peninsula and York), Everett Boyle; grade IX, Shigawake Intermediate School (Matapedia to Shigawake), Eldred Fitzgerald; grade X, New Carlisle High School, George Chisholm.

Labor Supply Still Short

Labor shortage for woods and mill operations still constitute one of the chief difficulties with which pulp and paper operators have to contend. This is common to all concerns grappling with reconversion problems. According to the federal Department of Labor, the Dominionwide labor shortage shows no immediate signs of easing. The latest returns showed that there were 126,000 jobs to be filled, with only 48,000 applicants for jobs registered. According to the Department, higher wages in manufacturing and war industries are a factor in meeting the labor requirements for primary industries. As wage rates, generally speaking, were more attractive in the manufacture of munitions and implements of war, the National Employment Service is encountering some reluctance of workers to transfer to peacetime industries.

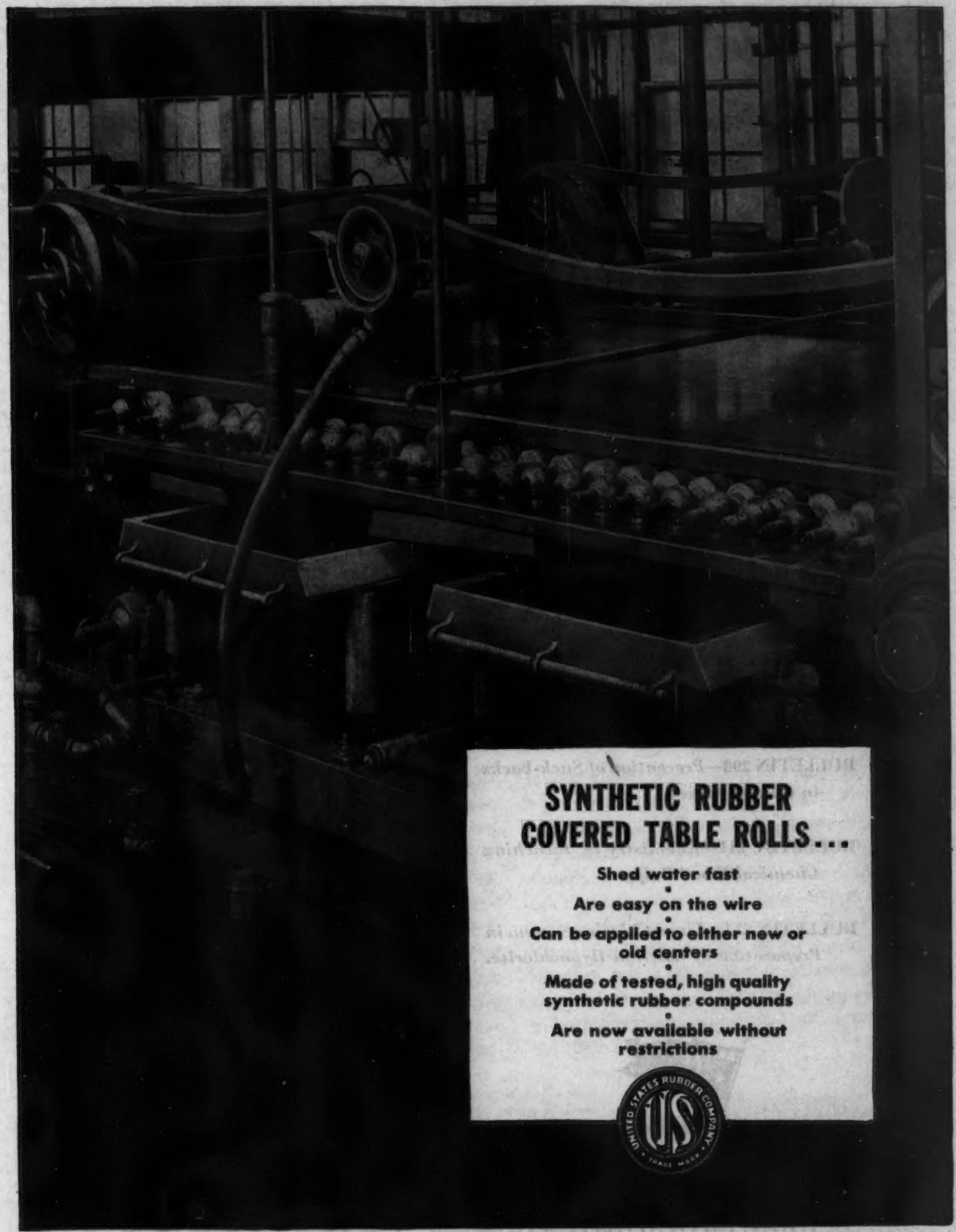
Building Paper Mill Opened

Building Products Limited have announced the opening of their new paper mill at Ville Lasalle, a suburb of Montreal. This mill is the largest single unit in the company's expansion program. Costing $400,000, and covering an area of 45,000 square feet, the mill will produce felt-sand sheathing papers for asphalt roofing, shingles, sidings and building papers, relieving the acute shortage of these vital builders' supplies. In the construction of the mill the company has availed itself of experience gained in erecting similar plants at Pont Rouge, Que., and at Winnipeg. The mill's layout and placing of equipment are said to make it the most modern of its class.

Operated at rated capacity, the mill will have an annual output of 12,000 tons of paper. The new project will also release facilities of the Pont Rouge mill for exclusive manufacture of insul-board and insulbric siding, thus raising the total production of these commodities. Potential scope of the market now existing for building products is seen in the vast Dominion-wide shortage of domestic housing, which will involve during the current year the erection of some 50,000 houses and an estimated 60,000 new dwellings annually for the next nine years. In addition to the domestic market, a considerable export market has lately developed, especially in Great Britain and France.

Lagerloef Joins Pagel, Horton & Co.

Pagel, Horton & Co., Inc., of 347 Madison Avenue, New York City, have appointed Jerry Lagerloef as sales representative for the Middle West, with headquarters at Kalamazoo, Mich. Mr. Lagerloef was previously connected with Lagerloef Trading Co., Inc., Rayonier Co., Inc., and the War Production Board.



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How to Get More out of Your Chemicals

By maintaining constant vigilance in manufacturing and shipping uniformly high quality chemicals, we have endeavored to serve the pulp and paper industry. You can always depend upon Hooker for the quality you want in pulp and paper chemicals.

Another way that Hooker has been helping pulp and paper makers is through the services of its Technical Staff. The close cooperation of Hooker chemists with pulp and paper makers is well known in the industry. The results of this relationship are found in the technical papers and bulletins Hooker has printed and offers to all those interested. These bulletins suggest the way to improved processes, greater economies and higher quality production for you.

They cover many phases of your operations and should be of value to your present operations as well as for your post-war planning. Some of the Hooker bulletins of interest to the paper industry are listed below. Copies will be sent you when requested on your letterhead.

HOOKER BULLETINS

BULLETIN 201—*Process and Equipment for Making Bleach for Use Without Settling.*

BULLETIN 208—*Prevention of Suck-backs in Chlorine lines.*

BULLETIN 211—*Chemistry of Bleaching Chemical Wood Pulps.*

BULLETIN 234—*Lime-Chlorine System in Preparation of Calcium Hypochlorite.*

BULLETIN 236—*Importance of pH and Catalysts in Bleachery Operations.*

BULLETIN 241—*Bleaching Gumwood Sulfate Pulp.*

BULLETIN 242—*Production and Use of Unsettled Bleach Liquor.*

BULLETIN 243—*Procedures and Brightness Grades in Bleaching Sulfate Pulps.*

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To users of Dorr equipment in all fields throughout the North American Continent, The Dorr Company offers quick, expert, engineering service... to a water works in Mexico, a sugar central in Cuba, a sewage disposal plant in Newfoundland, a paper mill in Quebec or a gold mine in Alaska.

The Dorr Company maintains a staff of thoroughly trained engineers at strategic points throughout *half a hemisphere* to render immediate service wherever and whenever needed... service in all fields to all Dorr installations whether they consist of a single piece of equipment or a complete process plant.

This extensive service is the direct result of a fundamental sales policy of The Dorr Company—Dorr takes the view that it sells not merely equipment but *the solution to the problem for which the equipment is intended.* Therefore, Dorr's interest in the purchaser does not end at the time of installation but continues far beyond. Dorr equipment provides an efficient, economical solution of the client's problem.

Avail yourself of Dorr's comprehensive knowledge of a wide variety of fields; gain the advantage of the service of Dorr engineers; take up your process equipment problem with The Dorr Company.

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DORRCO

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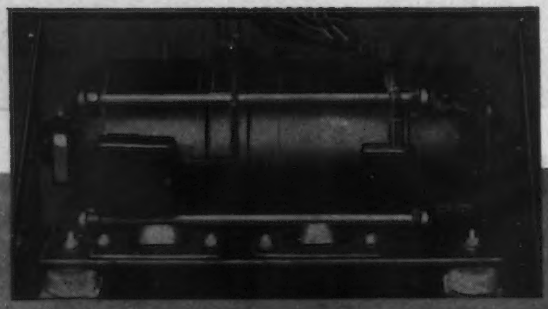
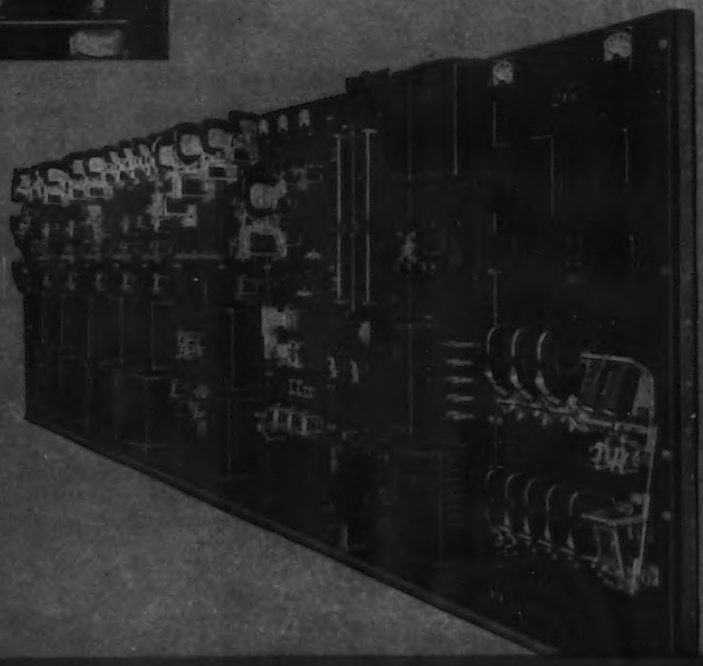
Now, **new simplicity of control has been added to basic advantages of sectional drives for paper machines. Speed regulation is more precise over a wider speed range. Response of the regulator is so rapid that load changes do not adversely affect speed. High-maintenance elements, such as cone pulleys and carbon piles, are unnecessary. This G-E system sets the pattern for flexible operation of tomorrow's high-output machines.**



THE G-E AMPLIDYNE—the war-proved amplifying generator that is revolutionizing today's systems for speed and torque control. Only G.E. has the combination of experience for applying it in systems with electronic control to solve practical paper-mill problems.

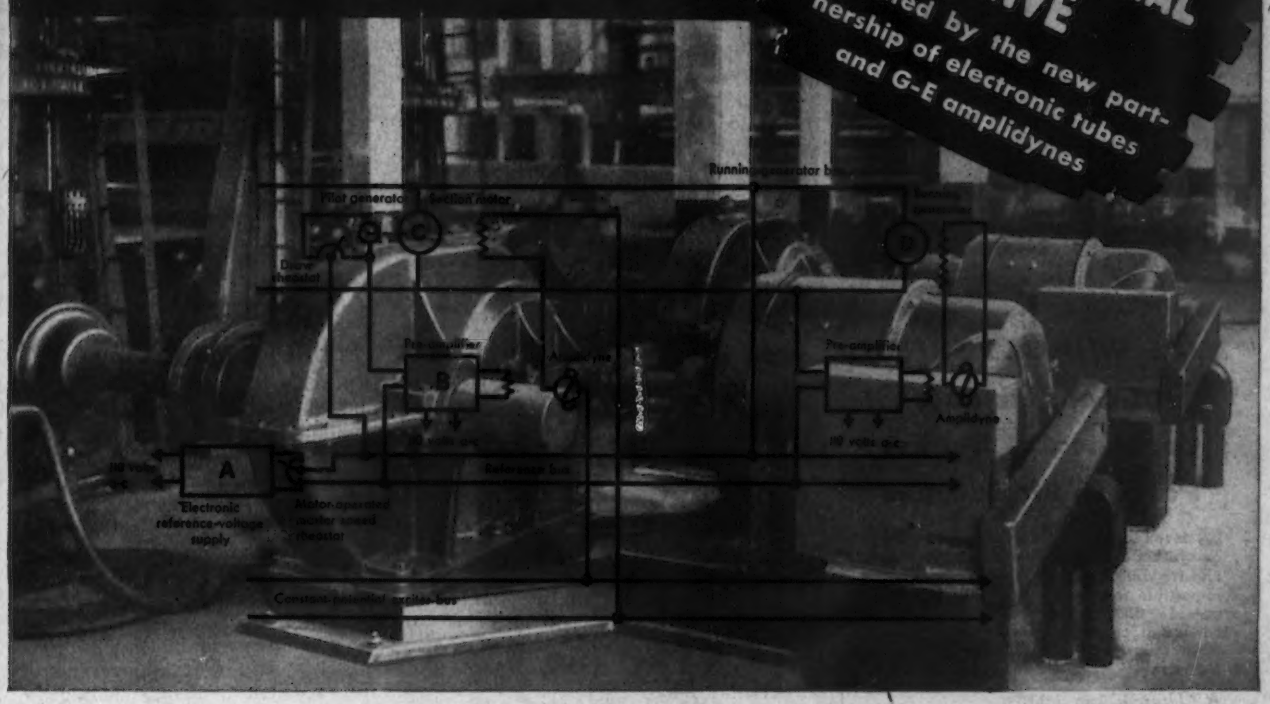


FACTORY-ASSEMBLED PANELS—To save your installation time, G.E. assembles paper-machine control panels complete on a self-supporting steel framework. Shipped complete, they require only motor and line-power connections on the job. This panel was shipped complete for sectional-drive control of a modern paper machine.

GENERAL ELECTRIC

. at high speeds or low

G-E SECTIONAL DRIVE
regulated by the new partnership of electronic tubes and G-E amplidynes



HERE'S HOW G.E.'S NEW REGULATING SYSTEM HOLDS SPEEDS TO 0.05 PER CENT

An electronic reference-voltage source (A) is the bench mark for the entire system. Each section motor (C) has a pilot generator, whose output is balanced against this reference voltage source. Any voltage differential is introduced into the pre-amplifier (B), and then, through the amplidyne, acts to change the excitation of the section-motor field. So responsive is the action that the over-all effect in maintaining motor speed seems preventive rather than corrective. Speeds are held within 0.05 per cent of preset levels despite variations in loading.

A small rheostat in each pilot-generator circuit permits close adjustment of draw. A motor-operated rheostat in the voltage-reference circuit provides for preset *over-all* speed control, without disturbing relative speeds or draws between sections.

Voltage of the main generator (D) is also amplidyne-regulated from the reference-voltage source. This makes for greater stability to meet changes in load without affecting the section motors.

G.E. has pioneered in paper-mill sectional drives; auxiliary, and other drives requiring close control of speed and torque. Our practical experience can help save engineering time for user and machine builder. Better check with our application engineers *early* in your plans. *General Electric Company, Schenectady 5, New York.*

Buy all the BONDS you can—*and keep all you buy*

YOU END CLOGGING of Bonnets and Corrosion of Bonnet Parts in Stock Lines

■ A tough resilient diaphragm of rubber or synthetic completely *isolates* the bonnet and its working parts from the body. It is impossible for stock to clog the bonnet or corrode the working parts. There is no chance of contamination of your product by accumulations of lubricant or other undesirable materials from the bonnet.

- *Closure* is drip tight.
- *Repair* is easy, rapid and cheap. Removal of bonnet makes it easy to get at interior of the valve.
- *Headroom requirement is low*—as much as 25% less than that required by other types.
- *Flow characteristics* at full open are close to those of gates and plug cocks, yet the valve lends itself admirably to *throttling*.
- *Available* in handwheel, lever operated and sliding stem types — the last named can easily be attached to standard operators. Body materials may be of any machinable alloy or cast iron, plain, galvanized, or lined with glass, lead, rubber, lacquer, paints, etc.
- *Size Range* ½ to 14" makes this valve available for practically every pulp and paper mill service where pressure does not exceed a maximum of 150 psi. (small sizes) down to 50 psi. for large valves and where temperatures (depending on service) do not exceed 200° F. Write for Catalog V-44. HILLS-McCANNA CO., 2447 West Nelson Street, Chicago 18, Illinois.

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SAUNDERS PATENT
Diaphragm VALVES
Proportioning Pumps—Force-Feed Lubricators —Chemical Valves—Air & Water Valves— Marine Valves — Magnesium Alloy Castings

Imports From Canada Up

Import statistics showing shipments of paper from Canada to the United States during 1944, now available in complete form, show the effect of the existing reciprocal trade agreement with Canada, according to Warren B. Bullock, Manager of the Import Committee of the American Paper Industry.

A tabulation sent to the paper industry shows that in 1944 imports of printing paper from Canada alone totaled 26,000 tons. In 1938, the year before the duty on this paper was reduced 40% under an agreement with Canada imports from Norway, Sweden, Finland and Canada totaled only 9,500 tons. Despite war time limitation on Canadian production, Canadian shipments increased from the 1938 total by a total of 18,500 tons, equivalent to loss of employment by American paper mill workers of over 55,000 working days. The duty rate on paper imported in 1944 was less than the difference in value between United States and Canadian currency, with the result that Canadian paper is sold in the United States market not only without any duty protection, but at an actual bonus over American prices. Of the 1944 printing paper imports, 8,000 tons were of paper valued at over 3¼ cents per pound, or book grades, as against a total of such paper imported in 1938 of 25 tons.

Canadian shipments of other grades of paper included 28,000 tons of pulpboard for use in the manufacture of wall board, 18,000 tons of paperboard, 8,000 tons of wrapping.

Sumner Ready at Vancouver

New improved pulp mill machinery, including hydraulic barkers of the latest type, will be built at Vancouver for British Columbia's pulp industry. With the rapid growth in the manufacture of pulp from the softwoods of the Pacific Coast region, engineers of the Sumner Iron Works of both Everett, Washington, and Vancouver, B. C. have paid particular attention to the designing pulp machinery adaptable for the needs of this area.

With its new, modern, well-equipped plant in Vancouver, capable of manufacturing machinery of the size and capacity of any mill, the Sumner organization has plans well advanced to meet increased business which will be available as the pressure for supply of machinery and equipment for direct war purposes relaxes.

Among the important contracts definitely arranged is one calling for the future construction of hydraulic barkers as developed jointly by engineers of Crown-Zellerbach Corporation and of the Sumner organization. The equipment will be built by Sumner in Everett, Wash., for the U. S. A. plants and by Canadian Sumner Iron Works in Vancouver for Canadian plants of Crown-Zellerbach. This arrangement follows the success attending installation of a number of hydraulic barkers in recent years.

Sumner machines of these types are in service at B. C. coast plants at Fort Alice, Woodfibre, Port Mellon, Powell River, Ocean Falls and Victoria. Before the war also the Vancouver plant built and supplied Sumner pulp mill machinery to Australia and Tasmania. Already the Vancouver company has on hand enquiries for further business from the Antipodes and also from South Africa for post-war delivery.

Empties Bags Easily

The Ritchie Bag Dumper for lifting and emptying heavy bags has been announced by ASCO Manufacturing Company, 601 So. Anderson St., Los Angeles 23, Cal. Operating on a ¼ horsepower electric motor the machine will quickly lift and empty bags of grain, nuts, sugar, beans, cement, ore, powdered glue, dry chemicals, or anything that comes in bags, up to 350 pounds.

The Dumper eliminates back-breaking lifts and fatigue; prevents rupture accidents; stops wastage from spilling; keeps the floor clean; reduces dust; can be wheeled about as needed, and may be operated by a boy. An automatic shut-off switch stops the motor at top and bottom positions of the lift. As an added safety feature, a special clutch arrangement disengages the motor if downward return of chute is obstructed. The upward lift takes ten seconds, with eight seconds to lower.

An adjustable height chute at the front fits narrow openings and funnels the bags' contents into a vat or machine without spilling. Two spikes catch and hold the bag while dumping. The chute will handle a bag 24 inches wide.

Cross Joins Crocker Wheeler

E. G. Cross has been appointed supervisor of the production planning and control department of the Crocker-Wheeler Division, Joshua Hendy Iron Works at Ampere, N. J. Prior to his association with Crocker-Wheeler, Mr. Cross had already gained a wide experience in the industrial management field. His background covers managerial positions in methods and procedures, contracting, accounting, material control, production control and production.

AMERICAN ANODE

Rubber and Plastics water dispersions for coating, impregnating, cementing

Pioneer in water systems seeks problems relating to paper treatment

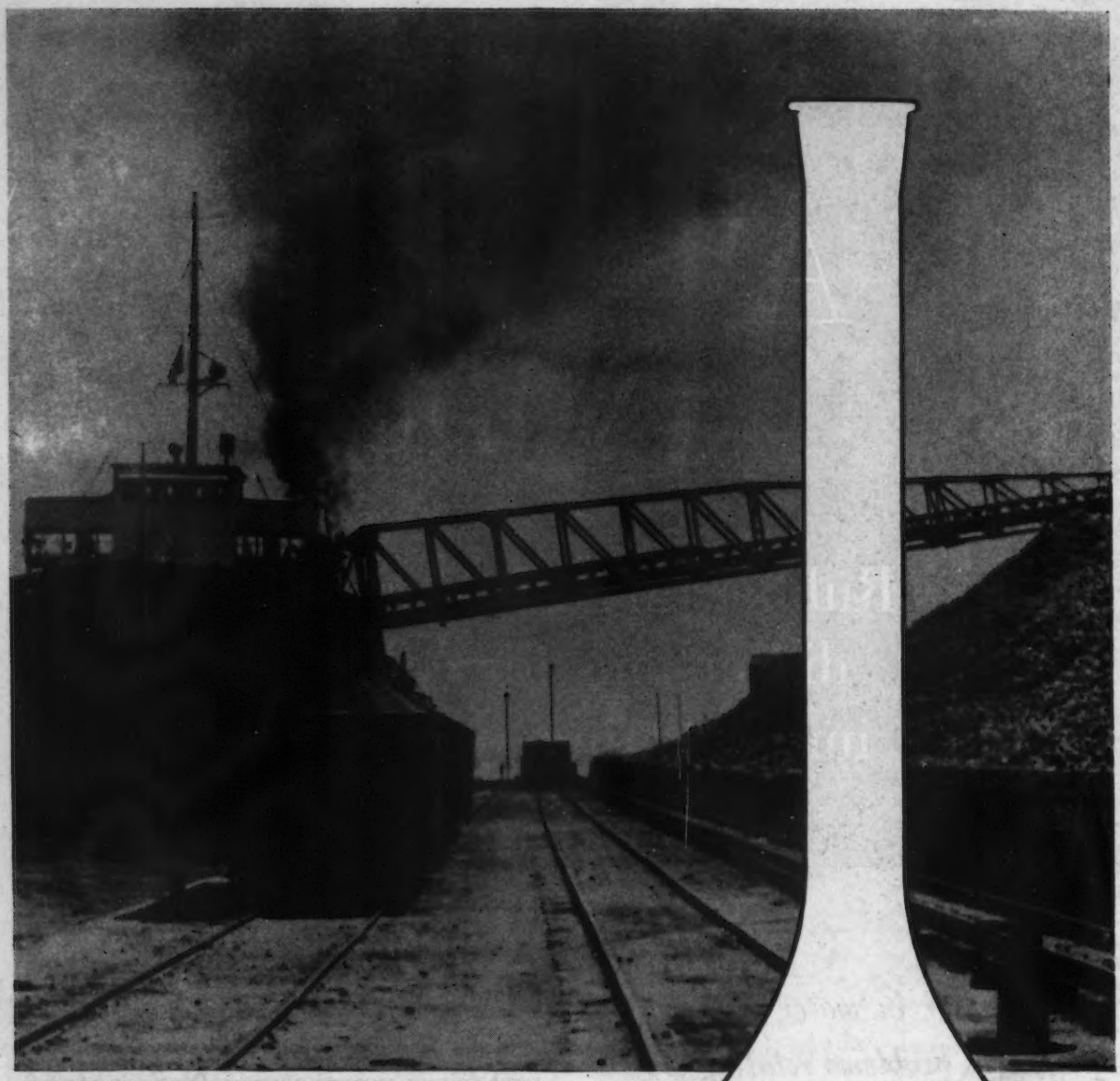
THERE are three good reasons why American Anode water dispersions of natural and synthetic rubbers and plastics can be used to advantage in treating paper.

First, there's the *experience* that American Anode has accumulated over a period of many years. American Anode pioneered the work with water dispersed rubbers and plastics. That's why we invite you to submit your paper treatment problems to our development laboratory staff. We honestly believe that we can help you because we *know* how to use water dispersions most effectively.

Second, there's *economy.* Water systems do away with the need for expensive solvents and cumbersome solvent recovery systems. Processing is simplified. In most cases, it actually *costs less* to treat paper using a water dispersion.

Third, there's *safety.* Water just won't explode, causing dangerous and expensive fires. Nor will water give off toxic fumes. Our laboratory facilities and research staff are at your service. For more information please write American Anode, Inc., 60 Cherry Street, Akron, Ohio.

AMERICAN ANODE
INCORPORATED
NATURAL AND SYNTHETIC RUBBER LATICES, WATER CEMENTS AND SUSPENSIONS



One of the four Company-owned ships unloads limestone at Wyandotte—8800 tons of it in only four to six hours! Endless belts carry the stone from the freighter's hold to an elevator, and thence to one of the largest movable booms in use on the Great Lakes.

STONE AHOY!

Wyandotte
REG. U. S. PAT. OFF.

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MICHIGAN ALKALI DIVISION • WYANDOTTE, MICHIGAN

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ONE OF THE WORLD'S GREAT PRODUCERS OF CHEMICALS

SODA ASH	HYDROGEN
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BICARBONATE OF SODA	AROMATIC INTERMEDIATES
CALCIUM CARBONATE	DRY ICE
CALCIUM CHLORIDE	Other Organic and Inorganic Chemicals
CHLORINE	

OWI Photo by Palmer in an Allegheny Ludlum plant

Stainless Steel Carriers
FOR WAR'S VITAL LIQUIDS

At your Service...

ALLEGHENY LUDLUM'S FILM LIBRARY

Instructional films on tool and stainless steels—some in full color, all with sound—available for free showings by companies, trade & industrial groups, student training courses, technical schools and colleges, etc., upon request.

WRITE FOR DETAILS

ADDRESS DEPT. PT-34

WHO'S to say what job is more vital than another, when the chips are down? Those Allegheny Metal tubes aren't gun barrels, but they carry charges quite as potent in the overall picture. Much stainless tubing has gone into the manufacture of high-octane gas, synthetic rubber, magnesium, food and dairy products, etc.—and in more minute sizes, it is indispensable in aircraft fuel and instrument lines, drug and medical work and similar uses.

In each case, the job was a function of stainless steel's ability to withstand corrosion or heat, or impart greater strength and reliability. Where can Allegheny Metal—either in tubing, bars, wire, sheets, strip, castings or forgings—operate to improve *your* products? Our Technical Staff is at your service.

Allegheny Ludlum
STEEL CORPORATION
GENERAL OFFICES: BRACKENRIDGE, PENNA.

W&D B-9333

Allegheny Metal also handled by all Joseph T. Ryerson & Son, Inc. warehouses

PAPER
TRADE JOURNAL
Reg. U. S. Pat. Off.
W. L. Cook, Editor

WAR OUTPUT OF WOOD PULP

In the comprehensive pamphlet report of J. A. Krug, chairman of the War Production Board, recently issued, an outline of the importance of wood pulp in the war effort and the difficulties of providing supply to meet the rising demands, is given in a brief form. Out of every seven trees felled, the report states, five are headed for lumber and two for pulpwood. Like lumber, paper and paper products have been put to hundreds of new uses during the war as substitutes for other critical products, leaving less for requirements of paper and paper products for the more familiar uses, which have all risen sharply.

The cause of the tight supply begins in the woods, the report goes on to state, where the modern methods of pulpwood logging are slow to be adopted and where there is a shortage of loggers. Transportation difficulties, both for pulpwood logs and wood pulp, have played a part, as have decreased imports. The reasons for the increased demand, on the other hand, is directly traceable to increased military needs: Increases of ordnance pulp, used as a substitute for cotton linters in explosives, of waterproof papers for the Army, of photographic papers, of containers, of V-boxes for overseas shipments. . . . Strenuous efforts were made by the War Production Board during 1944 to augment the wood pulp supply, by increasing the efficiency of pulpwood logging, enlisting War Labor Board cooperation to permit needed wage adjustments, stimulating increased cutting of pulpwood by farm labor, arranging to increase imports from Canada, and limiting end use to those items directly connected with the war effort. A wastepaper salvage campaign was vigorously promoted during 1944. . . . While, therefore, the year's domestic output of slightly more than 10,000,000 tons of wood pulp was below the early years of the war, it did represent a gain of some 400,000 tons over 1943, and the conservation and control measures instituted during 1944 were expected to bring about a more equitable supply-demand balance in 1945, concludes the report.

JUNE PULPWOOD RECEIPTS GAIN

Mill receipts of pulpwood continue at a favorable level. Future production in the South, however, is dependent on how much war prisoner labor will be available. German prisoners have been an important factor in harvesting wood in this area and if these men are returned to Europe less wood is expected to be harvested.

Total receipts of pulpwood in June, amounting to 1,592,800 cords, were approximately 5% higher than in June, 1944. Total receipts for the first half of 1945, amounting to 8,386,500 cords, were about 1% under 1944. Based upon the WPB quota of 16,000,000 cords for this year, receipts in the first six months are nearly 5% under that quota. Imports for June as reported by the WPB totaled 186,600 cords, an increase of 9%; for the six month period, 736,700 cords, a gain of nearly 1%. Receipts in the Lake States of 139,200 cords, indicates a gain of 21% in June; in the Appalachian area, 142,100 cords, an increase of 9%; Northeast, 207,300 cords, a gain of 15%; South, 650,900 cords, a decrease of 3%; and in the Pacific Northwest, June receipts of 266,700 cords increased 6% over June, 1944.

PAPER OUTPUT HIGH

Production of all types of paper in June, 1945, totaled 1,476,082 tons, compared with 1,460,305 tons in June, 1944, reports the Bureau of Census in the latest release. The output of paper was 701,628 tons, compared with 769,465 tons in June, 1944. Total paper and paperboard production declined in June below May, 1945 moderately; the decrease in paper was 37,359 tons and in paperboard 3,980 tons.

The decline in the June, 1945 production of various types of paper below June, 1944, was in converting book and miscellaneous book papers, off 7,113 tons; in bag paper which declined 424 tons, in special industrial papers which declined 2,796 tons, and a decline in sanitary paper output of 3,149 tons.

Lower output in June, 1945, below June, 1944, was also indicated in cardboard, which declined 307 tons, and in miscellaneous board, 1,637 tons off.

The output of newsprint for June, 1945, was 61,175 tons; groundwood, 51,663 tons; book, 122,735 tons; fine, 82,169 tons; wrapping, converting and bag papers, 165,859 tons, converting coarse papers, 69,781 tons; multi-wall sack, 37,192 tons; tissue, 12,602 tons; absorbent, 7,729 tons and building paper, 74,644 tons.

PAPER INVENTORIES RISE

Sales and inventories of wholesalers of paper showed a contraseasonal decline in May of 5% from April, bringing the index down to 149.3. This decline in sales permitted inventories to show the first increase since October, 1944. These inventories for the month of May, as reported by the Department of Commerce, were up 2% from April. This may indicate a new trend, but the report states that wholesalers should not expect a rapid or sustained recovery from that point on. Continued betterment will be indicated by the size of imports from Sweden and the amount of pulp and paper released by the military and converted to civilian goods. How long or how much will be available is dependent on many factors, not known at the present time. It is expected that a fairly definite trend may be ascertained in the last quarter of this year.

WPB Relaxes Paper Orders

WASHINGTON, D. C., August 15, 1945—The War Production Board today announced the relaxation of five WPB orders affecting the printing and publishing industries, using chiefly book, groundwood printing and fine papers, to provide for doubling the permitted paper usage by veterans and other newcomers, and for an increase in the consumption quotas of established publishers amounting generally to 5% of the base period usage.

While supplies of printing papers, except newsprint, are becoming more plentiful, WPB officials emphasized that many types of paper and paperboard are still in extremely short supply because of military requirements.

Effective with the third quarter of 1945, amended orders L-241 (Commercial Printing and Duplicating), L-244 (Magazines and Periodicals), L-245 (Books and Booklets), L-289 (Greeting Cards and Illustrated Post Cards), and L-294 (Displays) fix paper quotas for established publishers generally at 85% of their base periods, with some deviation for small users who have the benefit of sliding scales. Returning war veterans and other new publishers and printers with no history of base period usage may now, on application to WPB, establish quotas of 10 tons of paper per quarter under the magazine order, the commercial printing order and the displays order, and quotas of 20 tons of paper in the last six months of 1945 under the book order.

Magazine publishers and commercial printers will be required under Orders L-244 and L-241, as amended, to regulate their orders and deliveries of newsprint so that their supply of newsprint on hand on October 1, 1945, will not be in excess of 45% of their usage of newsprint in the third quarter of 1945, or 60 tons, whichever is greater. This provision recognizes the fact that the supply of newsprint has not yet improved along with the supply of "white papers", and is a step toward placing all users of newsprint on a uniform basis.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1945		Corresponding Weeks—1944	
June 30	87.5	July 1	86.2
July 7	47.9	July 8	50.9
July 14	88.5	July 15	87.7
July 21	89.8	July 22	91.2
July 28	93.4	July 29	91.3
Aug. 4	*93.6*	Aug. 5	89.8

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1944	88.7	88.5	88.1	87.6	88.7	89.8	80.3	90.6	88.2	92.5	90.6	92.4	88.1
1945	86.7	89.4	90.2	88.1	89.8	91.2	*80.8*						

COMPARATIVE YEARLY SUMMARIES

	1938	1939	1940	1941	1942	1943	1944	1945
Year to Date	68.0	78.6	86.9	93.8	94.8	87.8	87.5	*88.1*
Year Average	71.5	83.4	85.6	97.4	90.4	87.8	88.1	

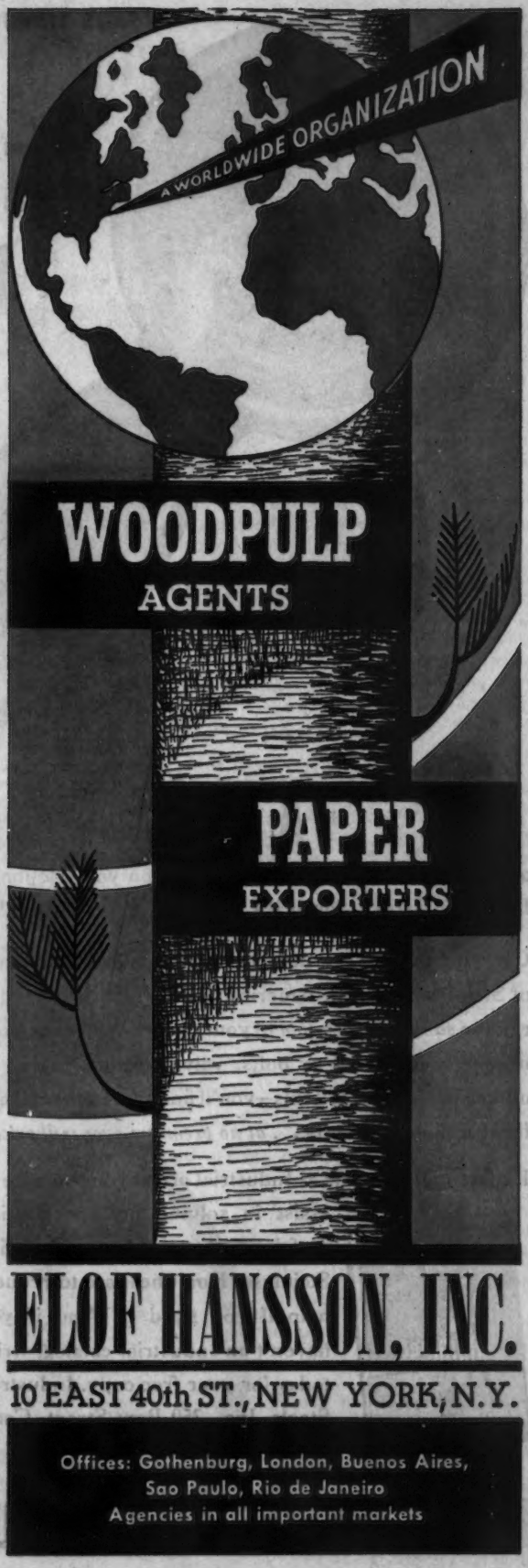
*Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

Current Weeks—1945		Corresponding Weeks—1944	
June 30	96	July 1	95
July 7	62	July 8	60
July 14	90	July 15	91
July 21	96	July 22	94
July 28	95	July 29	96
Aug. 4	*94*	Aug. 5	96

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1944	90	96	95	96	96	96	85	96	92	95	95	85	93
1945	91	95	97	97	96	96	*86*						

†Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.



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Low-Resin-Content and Resin-Free Pulp Plastics

By S. L. Schwartz,[1] J. C. Pew,[2] and H. R. Meyer[2]

Abstract

Experiments at the Forest Products Laboratory have demonstrated that molded plastics can be made from high-yield wood pulps in which little or no phenolic resin has been incorporated. A comparison of plastics so made with pulp plastics containing as much as 40% of phenolic resin by weight indicated some loss of ultimate tensile and compressive strength and lowered resistance to water absorption, but improved toughness. The most promising of the plastics containing no resin appeared to be those produced from pulps obtained by milling water-cooked chips. By coating the surfaces of the pulp mats with resin before molding them, their water resistance was considerably improved. Plastics of moderate strength and good water resistance were also produced by the addition of small amounts of water-soluble phenolic resin or nonphenolic resins.

In previous work on pulp-reinforced phenolic plastics *(1)*, it was found that the resin content of groundwood plastics could be greatly reduced and yet produce a pulp plastic comparable, except for water resistance, to a pulp plastic containing 40% of resin. The study of low-resin-content mixtures was therefore extended to include a variety of high-yield pulps.

Materials

A variety of aspen and spruce pulps and a neutral sulphite semichemical pulp from a mixture of black tupelo and sweetgum were used in these experiments. The aspen group consisted of a neutral sulphite semichemical pulp, a chlorinated and extracted modification of the same pulp, a groundwood pulp, and a water-cook pulp. The spruce group consisted of an acid sulphite semichemical pulp, a water-cook pulp, and a groundwood pulp.

The chlorinated and extracted pulp was obtained by treating aspen neutral sulphite semichemical pulp with 16% chlorine and a 7% caustic soda solution. This pulp was included as an example of a completely delignified, yet relatively high-yield product. The groundwood pulps were made in the Forest Products Laboratory experimental grinder and the others by milling the treated wood chips in a double-rotating disk mill. All pulps were evaluated and used as prepared. No further processing was used or required.

Two powdered phenolic resins, one of high and one of medium fluidity, were used. The high-fluidity type worked well in the plastics with a low resin content but was found not to be generally applicable for plastics with a high resin content. The resin of medium fluidity was therefore used in the plastics with a high resin content which are included in this study for comparison purposes. Water-soluble phenolic resins, a resinous byproduct from a wood rosin refining operation, and a soda spent-liquor lignin were used in some plastics. The powdered and water-soluble phenolic resins used for some of the plastics and the resinous byproduct from the wood rosin refining operation used in others are commercially available materials. The lignin used was an experimental material recovered from the spent liquor produced in the soda process for making paper pulp.

[1] Member TAPPI; Engineer, Forest Products Laboratory,[3] Forest Service, U. S. Dept. of Agriculture.
[2] Engineer, Forest Products Laboratory,[3] Forest Service, U. S. Dept. of Agriculture.
[3] Maintained at Madison 5, Wisconsin in cooperation with the University of Wisconsin.

TABLE I.—THE PHYSICAL AND CHEMICAL PROPERTIES OF THE HIGH-YIELD PULPS USED FOR PULP PLASTICS[1]

Pulp Type	Cook or Grinder Run No.	Yield Based on Moisture-Free Wood %	Freeness (Schopper-Riegler) ml.	Bursting Strength Points per pound per ream	Tearing Strength Grams per pound per ream	Tensile Strength p.s.i.	Density Grams per cc.	Cellulose Content Total %	Cellulose Content Alpha %	Lignin Content %	Total Pentosans Content %
					ASPEN						
Neutral sulphite semichemical	5073-N	75	590	0.68	1.00	5240	0.65	80.0	62.0	12.0	18.3
Neutral sulphite semichemical, chlorinated and caustic-extracted	5073-N	58	...	...	...	....	...	98.0	79.0	0.5	19.7
Groundwood	418	94	482	0.19	0.48	920	0.38	67.0	51.0	20.9	17.9
Water cook	2	80	597	0.28	0.61	1760	0.55	72.0	60.0	20.1	9.4
					BLACK TUPELO AND SWEETGUM						
Neutral sulphite semichemical	5083-N	81	895	0.10	0.60	130	0.24	70.0	55.0	19.7	17.7
					SPRUCE						
Acid sulphite semichemical	5071-I	75	890	0.22	1.13	660	0.30	69.0	55.0	20.8	7.6
Water cook	1	85	498	0.40	1.34	2230	0.47	61.0	49.0	31.1	7.7
Groundwood	395	94	460	0.25	0.71	1420	0.39	60.0	43.0	28.0	12.3

[1] Tests made according to Forest Products Laboratory standard testing methods for pulpwood, pulp, stuff, and paper.

Equipment and Procedure

Except as otherwise noted, the plastics tested were made by suspending the pulp, powdered phenolic resin, and zinc stearate (1% of the mixture) in water at about 1% consistency. A wetting agent was used to aid in dispersing the powdered material. The stuff was formed into a mat 8.5 inches in diameter in a pressure-forming apparatus. The resin content was calculated on the basis of the moisture-free weight of resin retained in the mixture. The wet mat was dried in a forced circulation oven at 35° to 40° C. (95° to 104° F.) for 24 hours and conditioned at 24° C. (75° F.) and 50% relative humidity for at least 24 hours before being molded. The materials with a high resin content were molded between cauls for 13 minutes at 160° C. (320° F.) and drawn hot. The products containing little or no resin were also molded between cauls for 13 minutes, but the molding temperature was increased to 180° C. (356° F.), pressures of 4,000 p.s.i. were used, and the panels were chilled before the pressure was released to prevent blistering. Although the higher molding temperature favored the moldability and improved the water resistance of the product, it is probable that lower pressures might have been adequate with some compositions. The method used to make these plastics is described in greater detail elsewhere *(1)*.

Testing of Plastics

Strength properties were determined on specimens taken from one to four nominal ⅛-inch-thick panels of each pulp plastic. In general, the number and type of specimens taken from each panel were as follows: two tensile specimens, two compression specimens to determine the elastic properties, four compression specimens to determine ultimate strength, five toughness specimens, and two water-absorption specimens. Tests other than toughness were made according to the methods outlined in "Federal Specifications for Plastics, Organic: General Specification (Methods of Tests) L-P-406, December 9, 1942." The toughness tests were made on the Forest Products Laboratory intermediate capacity toughness testing machine.

Results

The properties of the pulps and the corresponding plastics are given in Tables I and II. A comparison between the phenolic plastics containing about 40% of resin and the corresponding resin-free pulp plastics shows that the latter products had decidedly lower ultimate tensile and compressive strengths and, usually, considerably lower proportional-limit stress values in tension. On the other hand, the toughness values increased. The plastic flow of the resin-free materials, as measured, was practically nil, and the resultant plastics had relatively poor water resistance.

By the addition of 10 to 15% of resin, plastics intermediate in ultimate strength, toughness, and water resistance were obtained. Compressive-yield stress and proportional-limit stress values obtained were, on the other hand, almost invariably higher for the plastics containing little resin than with those of high resin contents. In a few cases the proportional limit stress in tension was also higher. The high-fluidity resin used in the lower-resin products may have been a contributing factor in these effects.

Groundwood plastics Nos. 113 and 160 (Table II) are strong but lack toughness and water resistance when compared with the average properties of the respective aspen and spruce groups. Neutral sulphite semichemical plastics Nos. 152 and 153, on the other hand, have both strength and toughness but again have somewhat high water absorption. Plastics Nos. 211 and 212, in which pulps produced from water-cooked chips were used, have good water resistance and moderate strength. The neutral sulphite semichemical pulp which had been delignified by chlorination and caustic soda extraction produced a plastic (No. 157) which, though not water resistant, has very high toughness and exceptional elongation in tension before rupture.

Pulps molded without resin produced plastics (Nos. 169, 167, 229, 215, 216, 185 and 214E in Table II) which were high in toughness and relatively low in tensile and compressive strength but varied from extremely poor to fair in water resistance. With respect to water resistance, plastics Nos. 215 and 214E, prepared from milled water-cooked chips, were decidedly the best of the resin-free plastics.

The water resistance of all the resin-free pulp plastics may be greatly improved by surfacing them with small amounts of resin. Coating the pulp mats with water-soluble phenolic while wet, as in the cases of plastics Nos. 198 and 189B, or surfacing them with paper impregnated with phenolic resin before they were molded, as in the cases of plastics Nos. 213 and 214C, was found to be effective. The latter method also improved the finish and permitted colored surfaces to be readily obtained.

Resinous materials other than powdered phenolic resin were added to certain high-yield pulps to aid in water resistance and moldability. By using as little as 14% of water-soluble phenolic resin, as with plastic No. 171, excellent water resistance was obtained in a neutral sulphite semichemical plastic. Sixteen per cent of a resinous byproduct from wood rosin refining was used in plastic No. 225. In plastics Nos. 186, 226, and 187 approximately 15% of lignin was used. In general, these nonphenolic materials are less effective than equivalent percentages of phenolic resin, but have the advantage of lower cost.

In some instances, these compositions may be laminated instead of being molded from a pulp mat. Thus, a resin-filled paper was made from the neutral sulphite semichemical pulp (No. 5083 N in Table I), which contained 11% of powdered phenolic resin. The powdered resin used in this pulp was added in the beater before the stock was run on the paper machine. The resin-filled paper was molded at 180° C. (356° F.) and 4,000 p.s.i. to form cross-laminated flat panels. The properties of the plastic thus obtained were:

Property	Value
Tensile strength	
Maximum, p.s.i.	18,900
Proportional-limit stress, p.s.i.	6,900
Modulus of elasticity, p.s.i.	2,000,000
Edgewise compressive strength	
Maximum, p.s.i.	17,200
Proportional-limit stress, p.s.i.	3,300
Modulus of elasticity, p.s.i.	1,800,000
Toughness (FPL), inch-pounds per inch of width	16
Water absorption, %	7.3

The reason why high-yield pulps, with or without small amounts of resin, can be readily molded into plastic-like substances has not been determined, e.g., the chlorinated and extracted neutral sulphite semichemical aspen pulp, which is practically devoid of lignin, molded to a fairly dense, coherent product (plastic No. 167, Table II). The moldability of this pulp may possibly be because of the fact that its hemicellulose content is high in comparison with that of ordinary chemical pulps. It would not be expected that hemicellulose, or any carbohydrate, as a bonding agent would contribute in large measure to water resistance. In fact, the plastic has the high water-absorption value of 135%.

TABLE II.—CERTAIN PROPERTIES OF PLASTICS MADE FROM HIGH-YIELD PULPS WITH OR WITHOUT RESINS

Plastic No.	No. of Panels Tested[1]	Pulp Type	Cook or Grinder Run, No.	Resin Content Based on Total Moisture-free Weight of Mixture, %	Type of Resin	Plastic Properties[2]												
						Molding Pressure, P.s.i.	Plastic Flow (Diameter Increase),[3] In. per 1,000 p.s.i.	Water Absorption in 24 Hours,[4] %	Specific Gravity	F.P.L.[5] Toughness, Flatwise ⅛ inch Thickness, In. lb. per inch width	Tension: Ultimate Strength, P.s.i.	Tension: Proportional Limit Stress, P.s.i.	Tension: Modulus of Elasticity, 1,000 p.s.i.	Tension: Elongation,[6] %	Edgewise Compression: Ultimate Strength, P.s.i.	Edgewise Compression: Proportional Limit Stress, P.s.i.	Edgewise Compression: Modulus of Elasticity, 1,000 p.s.i.	Edgewise Compression: Yield Strength at 0.2% Offset, P.s.i.
					ASPEN													
150	3	Neutral sulphite semichemical	5073-N	41	Medium-fluidity powdered phenolic	1,500	0.23	1.8	1.37	15	19,100	5,300	1,500	2.3	18,400	2,000	1,300	5,900
153	2	Neutral sulphite semichemical	5073-N	11	High-fluidity powdered phenolic	4,000	0.03	6.0	1.42	24	15,800	6,200	1,500	2.7	14,200	2,900	1,500	8,200
169	1	Neutral sulphite semichemical	5073-N	0		4,000	...	26.0	1.42	33	10,500	2,700	1,600	4.0	10,100	....	....	....
146	3	Neutral sulphite semichemical (chlorinated, caustic extracted)	5073-N	39	Medium-fluidity powdered phenolic	1,000	0.13	2.3	1.37	21	16,300	4,700	1,300	2.6	16,000	2,000	1,200	5,800
157	3	Neutral sulphite semichemical (chlorinated, caustic extracted)	5073-N	13	High-fluidity powdered phenolic	4,000	0.02	13.7	1.46	42	14,600	4,500	1,600	4.9	11,800	3,400	1,400	7,100
167	1	Neutral sulphite semichemical (chlorinated, caustic extracted)	5073-N	0		4,000	...	135.0	1.41	40	8,500	2,100	1,100	..	6,000	....	....	....
144	3	Groundwood	418	40	Medium-fluidity powdered phenolic	1,000	0.19	1.6	1.34	9	15,800	5,600	1,300	1.6	17,300	2,300	1,100	6,600
160	2	Groundwood	418	14	High-fluidity powdered phenolic	4,000	0.06	4.8	1.40	11	15,800	8,100	1,500	1.5	13,100	3,500	1,500	8,200
229	2	Groundwood	418	0		4,000	...	17.9	1.43	11	9,100	3,400	1,500	1.4	6,200	3,800	1,400	....
186	2	Groundwood	418	14	Soda-process spent-liquor lignin	4,000	...	5.1	1.41	9	10,700	4,600	1,400	1.5	10,900	3,200	1,300	7,500
198	1	Groundwood	418	11	Water-soluble phenolic[7]	4,000	...	2.1	1.40	14	.....	....	....	..	11,000	....	....	....
210	3	Water cook	2	39	Medium-fluidity powdered phenolic	2,000	0.41	1.2	1.36	12	17,200	4,200	1,500	1.8	17,300	2,400	1,300	6,400
212	3	Water cook	2	12	High-fluidity powdered phenolic	4,000	0.09	2.8	1.41	14	13,600	3,900	1,700	1.5	13,300	3,100	1,600	8,400
215	2	Water cook	2	0		4,000	...	6.3	1.42	18	9,200	3,600	1,500	..	9,800	3,600	1,400	7,700
225	4	Water cook	2	16	Wood rosin refining byproduct	2,000	0.09	3.7	1.40	12	8,300	3,200	1,400	1.6	11,000	3,800	1,300	8,200
226	1	Water cook	2	15	Soda-process spent-liquor lignin	4,000	0.06	3.8	1.40	12	8,000	3,700	1,300	..	9,900	....	1,300	7,500
					BLACK TUPELO AND SWEETGUM													
149	3	Neutral sulphite semichemical	5083-N	40	Medium-fluidity powdered phenolic	1,500	0.24	1.9	1.36	12	17,500	6,200	1,400	1.8	18,600	1,600	1,300	5,600
152	3	Neutral sulphite semichemical	5083-N	14	High-fluidity powdered phenolic	4,000	0.05	5.4	1.42	18	14,700	7,400	1,500	2.1	14,800	3,900	1,500	8,800
216	2	Neutral sulphite semichemical	5083-N	0		4,000	...	37.9	1.42	27	10,300	3,000	1,500	..	10,200	....	....	....
171	2	Neutral sulphite semichemical	5083-N	14	Water-soluble phenolic[8]	4,000	0.05	1.9	1.41	9	12,600	7,100	2,000	0.8	17,000	6,400	1,800	....
189A	1	Neutral sulphite semichemical	5083-N	2	Water-soluble phenolic[8]	4,000	...	9.6	1.44	18	10,600	2,200	2,000	2.1	10,400	3,500	1,500	....
189B	1	Neutral sulphite semichemical	5083-N	10	Water-soluble phenolic[7]	4,000	...	3.0	1.43	10	11,400	5,600	1,600	1.0	16,200	....	....	....
213	1	Neutral sulphite semichemical	5083-N	6	Spirit-soluble phenolic[9]	4,000	...	4.1	...	24	11,700	2,900	1,600	1.8	11,400	....	....	....
187	2	Neutral sulphite semichemical	5083-N	14	Soda-process spent-liquor lignin	4,000	0.05	9.0	1.43	13	10,300	2,900	1,600	1.7	11,700	2,700	1,500	7,500
					SPRUCE													
145	3	Acid sulphite semichemical	5071-I	41	Medium-fluidity powdered phenolic	1,000	0.31	2.0	1.35	10	17,400	6,100	1,500	1.5	17,500	2,200	1,300	6,100
156	3	Acid sulphite semichemical	5071-I	15	High-fluidity powdered phenolic	4,000	0.05	8.3	1.41	13	12,100	4,400	1,500	1.7	9,600	3,100	1,500	7,800
185	1	Acid sulphite semichemical	5071-I	0		4,000	...	24.0	1.42	15	6,900	2,900	900	2.3	4,300	....	....	....
209	1	Water cook	1	39	Medium-fluidity powdered phenolic	2,000	0.25	1.2	1.36	10	14,500	6,000	1,400	1.3	18,100	3,000	1,300	7,600
211	3	Water cook	1	13	High-fluidity powdered phenolic	4,000	0.06	2.7	1.38	13	11,500	3,400	1,600	1.3	12,800	2,200	1,400	7,100
214E	2	Water cook	1	0		4,000	...	6.8	1.39	20	7,400	2,300	1,200	..	8,400	....	....	....
214C	1	Water cook	1	5	Spirit-soluble phenolic[9]	4,000	...	2.6	1.41	..	.....	....	....	..	.....	....	....	....
86	4	Groundwood	395	40	Medium-fluidity powdered phenolic	1,300	0.25	1.5	1.35	7	15,500	5,800	1,400	1.4	17,100	2,700	1,300	7,500
113	1	Groundwood	395	12	High-fluidity powdered phenolic	4,000	...	4.6	1.39	7	14,000	6,500	1,800	1.0	15,200	4,100	1,500	9,400
					COMMERCIAL PHENOLIC PLASTICS[10]													
Wood-flour filled				50		....	...	0.6	1.34	2	7,100	5,500	1,000	..	24,100	3,300	1,000	....
Sisal filled				40		....	...	3.4	1.33	20	10,400	....	1,100	..	12,600	....	1,100	....
Chopped-tire cord filled				50		....	...	1.6	1.34	15	4,600	2,700	1,100	..	22,000	2,600	900	....
Aircraft-grade paper plastic (cross-laminated)				35		....	...	2.4	1.40	19	27,200	9,800	2,700	..	20,800	5,400	2,300	....

[1] Each panel furnished two tensile specimens, four compression specimens for ultimate strength determination, two compression specimens to determine elastic properties, five toughness specimens, and two water-absorption specimens.

[2] Properties were determined from specimens prepared, conditioned, and tested in accordance with Federal Specification for Plastics, L-P-406, Dec. 9, 1942, unless otherwise noted. Machined edges were not otherwise finished prior to test. Compressive stress-strain properties were obtained by testing a 1- by 4-inch specimen as a laterally supported column. Ultimate compressive strength was obtained by testing specimens 1 inch wide by ½ inch long in pairs, 1 inch apart and parallel. Values represent the average for the indicated number of tests.

[3] This value is based on the expansion of the pulp mat during molding and is considered to be a rough measure of the flowing ability of the mixture.

[4] Specimens ¼ inch thick, 2 inches square.

[5] Forest Products Laboratory intermediate-capacity toughness machine, unnotched specimen, ⅜ inch wide by nominal ½ inch thickness by 3½ inches long, tested over 2½-inch span.

[6] Elongation immediately before fracture, measured over a 2-inch gage length.

[7] The liquid resin was brushed on the surface of the wet pulp mats.

[8] The resin was dissolved in the water used to make the pulp suspension.

[9] The pulp mat was faced on both sides with sheets of resin-impregnated paper and molded.

[10] Result of tests made at the Forest Products Laboratory.

Plastics with a low water-absorption value were obtained when aspen groundwood pulps were employed, even though the lignin in wood is considered chemically combined with the hemicellulose and not available as a plastic binder. If wood is pressed under the same conditions used with these pulps, however, some transformation, accompanied by considerable darkening in color, takes place, and a plastic-like product is formed *(2)*. It is logical to suppose a similar effect occurs when the wood is reduced to the form of a mechanical pulp. It is conceivable that a partial separation of the lignin from the hemicellulose occurs during the molding operation and that this "activated" lignin contributes to the moldability of the product. Still further improvement is obtained with pulps from water-cooked chips, since considerable lignin is liberated during cooking, and the weakening of the bond between the fibers allows better defibering than is possible with groundwood. More drastic cooking, it is believed, probably would not give an improved product because of the degradation of the cellulose that would be caused and the possible polymerization of the separated lignin to a more infusible state.

Conclusions

The experiments described, while exploratory in nature, indicate that high-yield pulps have definite possibilities as plastic bases, particularly for low-cost products. From a raw-material standpoint, at least, considerable reduction in cost over high-resin-content plastics is indicated.

Further investigations of cooking procedures, pulp processing, and molding compositions are, of course, needed to bring about desired improvements. The necessity of cooling the molds before drawing the plastic would in some cases be a disadvantage, especially with shaped articles. Also, since flow is generally limited, accurate and uniform preforms would be necessary. To mold flat panels, however, the pulp might be formed into boards on equipment similar to that used in making insulating board. Such potentially low-cost products may need little or no improvement for some commercial uses.

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2. Seborg, R. M., Millett, M. A., and Stamm, A. J., *Mechanical Eng.* 67, No. 1:25, January 1945. Also FPL Report No. 1580.

Further Developments Required of Machine Coating*

By H. N. Case[1]

Abstract

Machine coated papers have had an expanding application in catalogs because better quality printing can be had at a favorable cost. Uncoated and brush coated sheets had been found to be unsatisfactory for quality work, or impractical.

There is need, however, for a coated sheet which can be used in four-color rotogravure printing and also one with a greater degree of heat resistance so that it can take heatset inks; the cost of these papers to be within economic limits.

As a pioneer in the application of machine coated printing paper to the needs of mail order production, Sears, Roebuck and Company has kept in close touch with the development since its inception. The concept of Sears, Roebuck and Company of additional needs and requirements of such paper, therefore, is based on this background.

Going back to the days when only oil absorption inks were available, efforts to print four-color work on uncoated paper on web presses that delivered finished, folded bindery units were very discouraging. For a number of reasons, including physical condition of rolls, regular brush coated paper was impractical for the purpose.

The uncoated paper used for such printing had to have a soft and absorbent surface if even the thinnest ink films were not to offset and smear. Likewise, the paper was very gray in color because of a large percentage of groundwood pulp in the furnish. This high percentage of groundwood, however, had been found favorable to this kind of printing. With these drawbacks in both inks and paper, it is not surprising that the colors in a finished job were very dull and lifeless.

Then heatset inks appeared on the market and they, too, were tried. In these experiments it was observed that little benefit could be derived from heatset inks unless expensive paper was used.

Machine coating of groundwood paper appealed to the larger users of letterpress printing. It offered a way to reduce paper cost and at the same time give the desired appearance to the finished printed job. Some of the earlier machine coated paper, however, had so little mineral coating on the surfaces that the fibers were not covered. It was difficult with such paper to get a surface that would print smoothly and that would stand the surface pull of the inks.

As a result of collective effort, tests were developed to evaluate printability. These tests made it possible to obtain numerical or visual values of ink affinity, tack, surface printability, and ink value. The use of these tests materially aided in formulating and in manufacturing a better machine coated paper.

Today, with heatset inks and 40 pound machine coated paper, a quality of printing is being obtained on high speed rotary presses that formerly was obtained on 55 pound brush coated when printed on sheet fed presses and delivered in sheets. This accomplishment has materially changed the economies of four-color printing and has permitted considerable expansion in the application and consumption of four-color units in the Sears, Roebuck catalog.

It should be emphasized that during the war it has been easier to maintain quality in the machine coated grades than in the conventional brush coated paper.

Paper for Rotogravure Process

A project for the development of a machine coated paper for high grade four-color rotogravure printing

* Presented by title at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 19-22, 1945.
[1] Sears, Roebuck and Co., Chicago, Ill.

on high speed rotary gravure presses with folders should be on the docket for collective work and development. After the war, the rotogravure process probably will continue to be increasingly popular. Many of the paper mills now making uncoated gravure grades also are planning to add coating equipment. Since machine coated paper as now constituted has not proved satisfactory to printers of large rotogravure jobs, it will be necessary for all manufacturers of machine coated papers to recognize this deficiency and to do something about meeting it if they desire to share in this large market.

Inasmuch as many of the machines now producing raw stock for supercalendered roto, according to present plans, will be changed over to machine coating after the war, the required rotogravure tonnage must be obtained from machine coated paper. Really, it seems advisable that an engineering project be entered into by the producers of machine coated paper and TAPPI to develop a machine coated paper that will print rotogravure satisfactorily.

Roto presses at present are capable of operation at 1800 feet per minute. After the war, this speed may be increased to 2000 feet.

With such high operating speed of roto presses and with the new methods of cylinder etching, the need for study to produce better paper surfaces is evident. While it is hoped the problem may be easier than producing a paper for the present conventional square cells in rotogravure cylinders, a new technique in compounding the coating will be required to secure the proper resiliency and affinity.

The most important physical properties desired in such a paper are: improved rotogravure ink receptivity and a coating resilience greater than that possessed by the starch machine coated paper now available.

The exact relationship of roto cylinder etching and paper characteristics is yet to be worked out. Apparently no paper will blot out all of the ink from an intaglia etch. Maybe such a paper is not desirable.

One thing is certain, however, and that is that no rotogravure printer likes machine coated or any other coated paper for big production jobs. In this attitude is revealed the need for improved machine coated paper. With proper cooperative effort, a paper can be made to fill this need.

Heat Resistance

There also is a need for a machine coated paper with greater heat resistance. Such a paper would be particularly desirable in heatset printing.

In heatset printing, terrific heat is applied to paper on the press in order to set the inks. This heat may be so intense that the paper becomes too brittle for the folder and subsequent binding operations.

This problem concerns both the ink maker and the papermaker.

The attempt is being made by ink makers to develop inks that will require less heat for drying. It is questionable, however, if such inks can be made without sacrificing production or quality of printing.

It seems that what is needed is something to be added to the paper furnish or to the coating that will impart heat strength to the finished paper. The paper industry has had a comparable problem in the production of wet strength paper. This problem has been met and now wet strength paper is being produced by many mills. Therefore, is it beyond the realm of possibility to produce a paper with heat strength comparable in numerical terms to the wet strength now being produced? It is believed that the answer is "No."

Obviously publishers of both magazines and catalogs will prefer these new grades of coated paper in place of the former uncoated paper if the combined improvements in quality from an advertising and production standpoint warrant the increased cost. Some mills installing coating equipment will doubtless be successful while others may expect too much from too little. Each improved grade must compare favorably when printed with any former quality, price considered, and the final judges will not always be printing or paper technicians.

TAPPI Notes

P. W. Bartholomew, formerly of the Hercules Powder Company is now technical director of the Hawthorne Paper Company, Kalamazoo, Mich.

William J. Parmeley, formerly student at the New York State College of Forestry is now chemical engineer in the Research Department of Durez Plastics & Chemical Inc., North Tonawanda, N. Y.

W. A. H. Buddingh, formerly of the McBryde Sugar Company is now chief engineer for the Lihue Plantation Company, Ltd., Lihue, Kauai, Hawaii.

Sidney Hausman, formerly of the Congoleum Nairn Company is now a consulting engineer at Westminster, Md.

The Lithographic Technical Foundation, R. F. Reed, research director has moved from the University of Concinnati to 1800 Prairie Ave., Chicago 16, Ill.

L. E. Fitzgerald, formerly sales engineer for the Hercules Powder Company, Kalamazoo, Mich., is now resident manager for Hercules at 5228 No. Hopkins Street, Milwaukee 9, Wis.

Maxwell B. Carter, Jr., formerly of the University of Maine is now with the S. D. Warren Company, Cumberland Mills, Maine.

Ralph N. Prince, formerly of the University of New Hampshire recently received the chemical engineer degree from the University of Maine and is now a technical service representative for the American Cyanamid & Chemical Corporation, 30 Rockefeller Plaza, New York, N. Y.

Karl E. Prindle, formerly chief chemist is now vice president in charge of product development for the Dobeckmun Company, 3301 Monroe Ave., Cleveland, Ohio.

L. J. Parant has retired as vice president and general manager of the St. Croix Paper Company, Woodland, Maine. Mr. Parant went to Woodland from the Finch, Pruyn Company in 1915. He was formerly a member of the Executive Committee of the Technical Association of the Pulp and Paper Industry. Mr. Parant will live on a 100 acre farm in Kingsbury, Washington County, N. Y. (R.F.D. No. 1, Hudson Falls, N.Y.).

J. S. Wilson has retired as General Manager of the Dryden Paper Company, Dryden, Ont., but will continue as a director of the Company and reside in Uxbridge, Ont.

Robert S. Aries, field director for the Northeastern Wood Utilization Council will give a course in pulp and paper technology at the Polytechnic Institute of Brooklyn. It is being sponsored by the Department of Chemical Engineering and will be given on Thursdays, beginning October 1st, from 6 to 8 p.m.

Waste Water Utilization by Clarification*

By Charles Carpenter[1] and Cover C. Porter[2]

Abstract

Utilization of waste waters by removing suspended pulp fibers in a Spaulding type precipitator was carried through laboratory and pilot plant stages. A 1200 g.p.m. industrial sized unit was then developed which takes feed water containing 2 to 3 pounds per thousand gallons solids and delivers a clarified effluent containing 0.1 pounds per thousand gallons or less. Operation is continuous and trouble free. No extraneous chemicals or flocculating agents are required.

The initial units of Southland Paper Mills, Inc. consisted of the groundwood mill, one 234-inch fourdrinier, power plant, and necessary auxiliaries for the production of approximately 165 tons of newsprint per day. Water was supplied from five deep wells approximately 1000 feet deep in the Carrizo stratum. As a matter of economical operation, emphasis was placed on all possible reuse of white water within the groundwood mill and newsprint mill.

In the latter part of 1941, plans were laid for the addition of a 175 ton kraft mill. In order to economize on water, it was felt that further utilization of waste effluents that go out of the mill should be investigated from a viewpoint of using these waters in a manner not ordinarily done in the pulp and paper industry. In the early months of 1942, a suggestion was made by the Permutit Company that the Spaulding type precipitator might be employed to separate the suspended solids in these waste effluents from the water so that either one or both could be reused back in the system. As the suspended solids content of the waste effluents consisted entirely of wood fiber, the presentation of this idea was radically different from the utilization of the Spaulding type precipitator for other uses. The main use of the Spaulding precipitator had been for the removal of hardness from water in which the principle of operation is the formation of nuclei of precipitated material upon which more of the precipitate could form. The passage of the raw hard water and the treatment chemicals passing through a sludge bed of this precipitated material greatly reduced the time interval and retention period necessary for the removal of hardness from industrial waters. Another use of the Spaulding type precipitator is for removing silt from waters in which the principle involved is the flocculation and loading of the silt with some agent such as alum and passing the raw water through a sludge bed of this flocculated material. The waste effluent from a paper mill, however, contained an entirely different type of suspended material and, as it worked out, the suspended fiber acts as its own flocculating agent and its own loading agent, although, of course, no chemical actions are involved.

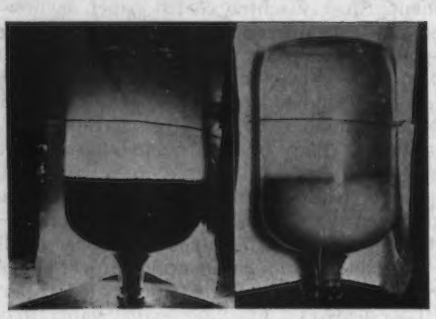

FIG. 2
Sludge Blanket Formed in Operation of Laboratory Apparatus

As prior jar tests conducted by the equipment manufacturer had shown that the principle of fiber sludge blanket clarification looked promising, further laboratory experiments were then conducted at the mill on typical waste water effluents.

Laboratory Experiments

In conducting the laboratory experiments to determine if the Spaulding type precipitator principle could separate the suspended fiber from the accompanying water in continuous operation, cylinder tests were first made to study the settling rate of these solids. White water, or waste effluent from the main sewer, was placed in 1000 ml. graduated cylinders and it was observed that the suspended fibers would settle very readily if the total solution was not contaminated with air bubbles. If the solution was contaminated with air it was found that minute bubbles clung to the individual fibers and caused them to float and congregate at the top of the cylinder instead of at the bottom. It was therefore seen that the first step to take in setting up a continuous operation experiment was to remove the air from the water. An apparatus was therefore devised as shown in Fig. 1. Water to be tested was passed into the small headbox which was so arranged that the effluent from the box was drawn off beneath the surface of the water which allowed the air bubbles to rise and escape from the surface. The mixture of water and suspended pulp fibers passed into the bottle until it was full and then overflowed down the ¼-inch pipe to

* Presented by title at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 19-22, 1945.

[1] Member TAPPI; General Supt., Southland Paper Mills, Inc., Lufkin, Texas.

[2] Member TAPPI; Chief Chemist, Southland Paper Mills, Inc., Lufkin, Texas.

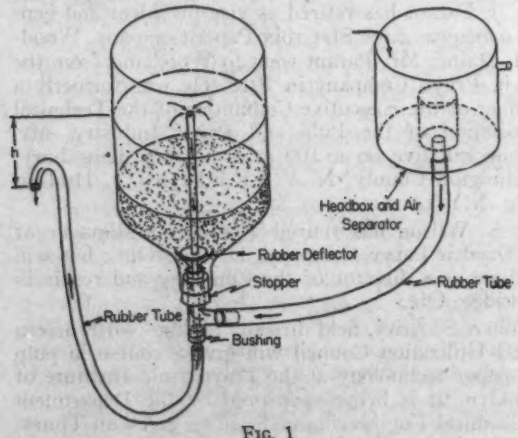

FIG. 1
Laboratory Apparatus

which a rubber hose was fitted for the purpose of varying the rate of flow by raising or lowering the point of discharge. The initial flow was started at a very low rate in order to build up a sludge blanket of settled fiber and then increased to a value which would give a flow rate of approximately 1 gallon per minute per square foot of bottle area. Figure 2 shows the appearance of the sludge blanket as it was in the continuous operation of Fig. 1. This sludge blanket had a gently rolling motion and the incoming water as it passed through the sludge zone left the suspended fiber behind and fairly clear water overflowed down into the ¼-inch pipe. The photograph was also taken by a transmitted light in order to show the clean line of demarkation between the sludge zone and the clarified water above. Figure 3 shows the component parts which consist of a ¼-inch pipe threaded for about 3 inches on the bottom end, a ¼-inch to ½-inch bushing, a ½-inch tee, a ½-inch closed nipple, and a ½-inch by 3-inch nipple. A rubber stopper to fit the 5-gallon bottle and bored to fit the ½-inch by 3-inch nipple plus a rubber deflector made out of gasket material complete the pieces. The influent passed into the ½-inch nipple from the combination air separator and headbox and the effluent overflowed into the top of the ¼-inch pipe inside the bottle and passed out through a rubber tube which was slipped over the small piece of ¼-inch piping seen protruding from the bushing which is screwed into the tee.

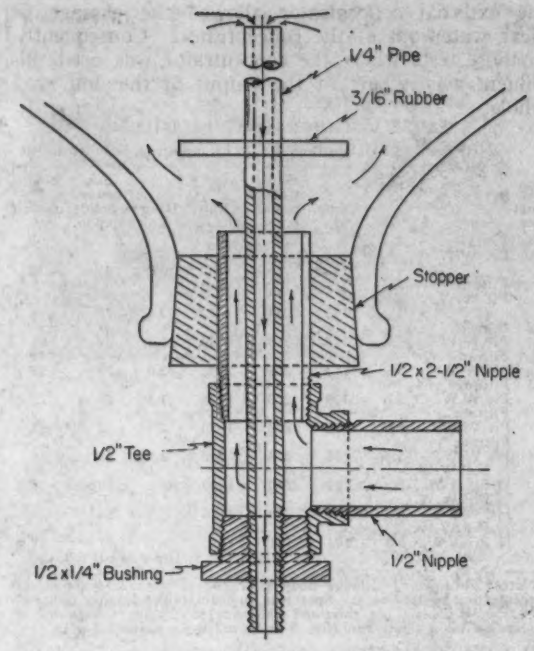

FIG. 3
Detail of Inlet Assembly

As there were no means to draw off the concentrated sludge after it had been left behind in the bottle, the maximum duration of the individual runs was only about 3 hours after which time the sludge became so heavy that it boiled up into the clarified water zone and necessitated starting all over again with an empty bottle. Table I is a summary of typical results obtained from the inverted bottle clarification experiments.

It was felt that the results as shown in Table I justified further investigation of the Spaulding precipitator theory of continuous removal of suspended pulp from water. It was decided therefore to carry on this investigation with a pilot plant.

The pilot plant work was started in the spring of 1942 and completed in the early summer of the same year. A small precipitator, 3 feet in diameter and 5 feet high, was obtained from the Permutit Company and certain home-made auxiliaries were made at the mill. As shown in Fig. 4, a 50-gallon drum was used as a headbox and also acted as an air separator by placing a 5-gallon can in the bottom and above the takeoff so that air bubbles were allowed to rise to the surface. Internal construction of the precipitator is also shown in a simplified form. Waste effluents supplied from the headbox passed into the conical section, passed under the edges at the bottom of the tank, and rose to a collecting launder from whence it flowed out of the unit by gravity. An external sludge concentrator was made from a 50-gallon drum consisting essentially of an open pan in the bottom of the drum where the sludge could settle and be periodically withdrawn to waste through the uptake cone. A collecting launder in

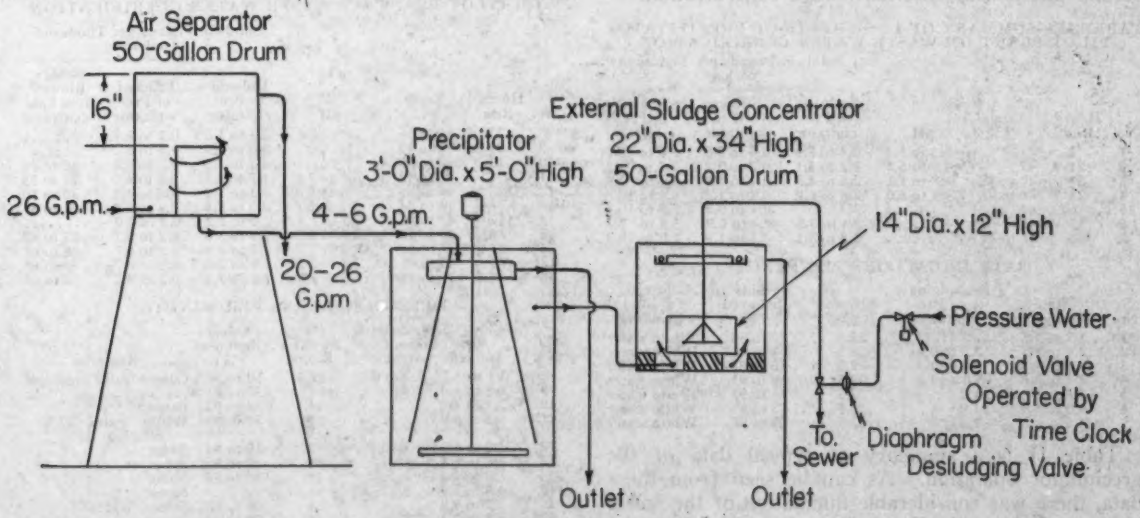

FIG. 4
Diagram of Pilot Plant

the external concentrator allowed the passage of clear water out of the concentrator. Consequently, in those tests where the concentrator was used this effluent was a part of the output of the unit as a whole.

TABLE I.—LABORATORY TEST DATA

Number	Source	pH	Influent to 5-Gallon Bottle: Temp. °F.	Solids Composite p.p.m.	Effluent from 5-Gallon Bottle: Rate ml./min.	Hours Run	Suspended Solids p.p.m.	Solids Removed %
1	Filtrate Pit W.W.	5.4 to 5.7	113	285	1100	3.0	82	72
	Filtrate Pit W.W.	5.4 to 5.7	113	285	800	3.5	78	74
2	Filtrate Pit W.W.	5.5	113	285	1050	1.5	53	81
	Filtrate Pit W.W.	5.5	113	285	1100	2.0	70	76
3	Filtrate Pit W.W.	5.6	108	273	1025	1.5	76	72
	Filtrate Pit W.W.	5.6	108	273	1050	2.5	52	81
	Filtrate Pit W.W.	5.6	108	273	900	3.5	38	86
4	⅔ F.P.W.W. ⅓ Fresh W.	6.5	104	210	1200	1.0	90	57
	⅔ F.P.W.W. ⅓ Fresh W.	6.5	104	210	1100	2.5	54	74
5	⅔ F.P.W.W. ⅓ Fresh W.	6.8	104	191	1050	..	47 at pH 6.8	75

Notes: Run No. 3—Sludge body after end of test=2880 p.p.m. or concentration of 10.5 to 1. Spot test on main sewer leaving mill run No. 3=1.54 pounds per thousand gallons=185 p.p.m. Composite of 6 hours on main sewer run Nos. 5 and 6=256 p.p.m. at 7.0 pH.

In the first fifteen runs the feed consisted of groundwood mill white water taken from one of the supply pumps. In runs 16, 17, and 18, the feed to the headbox was supplied from a portable gasoline pump which picked up part of the total waste effluent passing from the mill. As far as possible, test runs were made on a 24-hour basis. However, the usual amount of minor difficulties cut some of these runs down to shorter periods. The purpose of the pilot plant operation was to determine the effect of the variables encountered in the sewer, such as concentration of suspended solids, temperature, pH, etc., and to establish the clarification mannerisms of this type of equipment in terms of gallons per minute per square foot of area, the effect of velocity, and to get some idea of the maximum sludge concentration which could be handled. With this in mind, the pilot plant operation was split into two phases. The first phase consisted of operation of the precipitator alone without external sludge concentration and the second phase with external sludge concentration.

TABLE II.—SUMMARY OF LOG SHEETS OF PRECIPITATOR PILOT PLANT ON WASTE WATER CLARIFICATION

No.	Hours Run	Temp. °C.	pH	Solids in Pounds per Thousand Gallons: Influent to Precipitator	Effluent of Precipitator	Blowoff of Precipitator
1	4	47	5.3 to 5.4	2.4 to 7.9	0.6 to 0.8	5.0 to 8.0
2	21	47	4.9 to 5.3	2.2 to 7.1	0.2 to 2.2	2.7 to 8.7
3	23	47 to 48	4.8 to 5.1	2.6 to 4.5	0.4 to 1.8	5.2 to 7.4
4	23	40 to 48	4.9 to 6.0	2.8 to 6.9	0.2 to 1.0	6.5 to 10.8
5	6	43	.....	3.5	0.1 to 0.5	7.8 to 10.6
6	13	47	.....	2.4 to 3.5	0.4 to 0.9	5.8 to 7.8
7	22	41 to 46	.....	2.5 to 3.1	0.5 to 1.9	7.2 to 10.3

RATE IN GALLONS PER MINUTE

No.	Rate Influent	Desludging from Precipitator	Agitator R.p.m.	Solids Removed %	Remarks
1	3.5 to 4.5	.....	22.5	70 to 80	White water
2	2.4 to 4.5	0.7 to 0.9	22.5	54 to 91	White water
3	3.3 to 4.3	0.7 to 1.3	22.5	50 to 85	White water
4	3.2 to 3.8	1.1 to 1.2	22.5	68 to 91	White water
5	3.5	1.2	22.5	86 to 97	White water
6	4.0 to 4.4	1.2	22.5	73 to 85	White water
7	4.0	1.0	22.5	65 to 83	White water

Table II is a summary of typical data of the precipitator operation. As can be seen from these data, there was considerable fluctuation of the solids content of the mill effluent from hour to hour (the sampling cycle through all of the runs). The effluent from the precipitator likewise varied from hour to hour which in turn affected the value of the per cent solids removed. A graph of the solids content to and from the precipitator for each hour during these various runs showed that a sudden increase of solids content in the mill sewer for a short period of time did not materially increase the solids content of the effluent from the precipitator although increases of solids content in the mill sewer for a rather prolonged period of time did increase the solids content of the effluent from the precipitator. This accounts for the rather wide variation in the range of the per cent solids removed as shown in Table II. Although run No. 2 varied from 54 to 91%, removal of solids, run 4 varied only from 68 to 91% removal of solids. Analysis of the hourly values showed that this improvement in operation was caused by maintaining a constant rate of flow rather than by the effect of the concentration of solids in the water coming to the precipitator. It was soon seen that the operation of the precipitator alone did not allow a sufficient concentration of the sludge. The ratio of sludge concentration to solids in the influent was only about three or four to one which meant that some 25% of the water passed to the precipitator would have to be blown out to remove the accumulated fiber. Accordingly, the outside concentrator was installed and started in operation on run No. 8.

Table III is a summary of the typical data of the precipitator operation with an outside concentrator. As can be seen from the data, the concentration of the sludge blow-off increased to between twenty and thirty times the concentration of the influent to the precipitator. This meant that the volume of water which had to be blown off from the precipitator and concentrator as a unit was reduced to a figure well within reason. The operation of the precipitator in this second phase of the pilot plant work continued to be typical of the operation in the first phase. The per cent solids removed the precipitator varied over a fairly wide range of values depending on the variables of the operation.

Because of the multitude of data collected, a summary of the observations of the effect of the varia-

TABLE III.—SUMMARY OF LOG SHEETS OF PRECIPITATOR PILOT PLANT ON WASTE WATER CLARIFICATION

No.	Hours Run	Temp. °C.	pH	Solids in Pounds per Thousand Gallons: Influent to Precipitator	Effluent of Precipitator	Sludge Blowoff from Concentrator
8	23	41 to 56	.....	2.0 to 3.0	0.1 to 1.9	.....
9	21	48 to 49	.....	2.6 to 3.0	0.5 to 3.2	.....
10	13	37 to 45	.....	2.3 to 3.3	0.3 to 2.6	32 to 33
11	8	37 to 42	6.6 to 7.1	1.7 to 2.5	0.2 to 1.0	21 to 53
12	22	40 to 49	5.6 to 6.6	2.3 to 3.2	0.2 to 1.4	40 to 50
13	24	40 to 43	5.5 to 6.7	2.3 to 8.4	0.4 to 2.9	21 to 34
14	17	43 to 48	5.5 to 7.3	2.2 to 3.2	0.3 to 2.0	.....
15	18	46 to 48	6.0 to 6.2	2.3 to 3.6	0.2 to 0.7	25 to 42
16	13	37 to 40	7.6 to 7.7	2.1 to 4.8	0.3 to 0.7	20 to 68
17	24	40 to 41	7.4 to 7.6	1.9 to 2.6	0.2 to 0.7	30 to 67
18	24	35 to 41	7.0 to 7.5	1.6 to 3.5	0.2 to 0.5	30 to 66

RATE IN GALLONS PER MINUTE

No.	Rate Influent	Desludging from Concentrator	Agitator R.p.m.	Solids Removed %	Remarks
8	3.1 to 3.7	0.3 to 0.7	22.5	50 to 94	Concentrator installed
9	3.8 to 4.0.	0.15	14	50 to 83	.....
10	3.7 to 4.0	.....	14	34 to 92	Same
11	3.8 to 5.0	.....	14	76 to 89	White water 25% dilution
12	4.2 to 6.5	.....	14	50 to 94	Same
13	6.1 to 6.9	.....	14	50 to 85	Same
14	5.0 to 7.2	.....	14	40 to 86	Same
15	4.4 to 5.3	.....	14	.....	Same
16	5.1 to 6.8	.....	14	60 to 85	Sewer water
17	5.8 to 7.7	0.2	14	70 to 94	Sewer
18	5.5 to 7.2	0.3	14	77 to 99	Sewer

bles will be made rather than giving a set of tables. It was found in general that the variations of pH as such in the mill effluent did not materially affect the clarification operation. As explained before, it was found that changes in concentration of the suspended solids affected or did not affect the operation depending on the duration of time for which the solids content stayed at its new value. A sudden increase of solids content in the mill effluent for just a few minutes was absorbed by the buffering action of the volume of water in the precipitator while increases of a longer duration would make the precipitator effluent somewhat murky. Changes in temperature of the mill effluent was the variable that affected the operation most. A sudden increase in temperature of such a duration that gave an appreciable temperature difference between the influent to the precipitator and the effluent from the precipitator caused the sludge blanket to break loose and thus contaminate the effluent. This was apparently caused by the decrease in density of the sludge blanket in the bottom of the tank when the temperature rose which allowed this stratum of a lower density to rise into the cooler upper portions. It was also found that a sudden increase in velocity caused by an increase in the rate of flow into the unit would cause the sludge blanket to lift and expand and contaminate the effluent.

Industrial Size Clarifier

Based on the experience gained in the laboratory experiments and the operation of pilot plant in the field, it was decided to construct a full size industrial unit. The plant was designed to deliver 1180 g.p.m. and remove at least 85% of the suspended solids contained in the influent. The port rate was to be 4.95 gallons per square foot of collecting area, and the surface rate was to be 1.03 gallons per square foot of exposed water surface. The retention time was to be 120 minutes, and the sludge concentrator volume to be 1,590 cubic feet. The same problems were to be overcome in the operation of the large unit that had been encountered with the smaller units. First, some means had to be provided for collecting the water from the 36-inch main sewer line and elevating it to the operation point. Second, the air had to be removed from the feed before it entered the clarifier. Third, means had to be provided to run the unit as a whole at a more or less

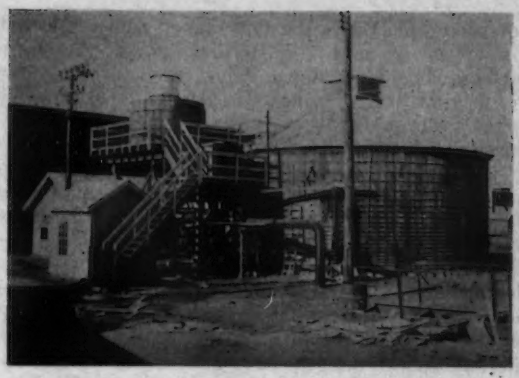

FIG. 6
Buildings Housing Unit

constant rate of flow in order to avoid sudden changes of velocity within the clarifier. Figure 5 shows the flow diagram of the unit, and the manner in which the three primary problems were solved. A concrete well was built around the 36-inch sewer with a dividing wall present to house the 3,000 g.p.m. pump and motor. After the well was completed, a 10-foot section of the 36-inch sewer was simply removed and replaced with a perforated screen which was revolved by a chain and spur gear drive. The water is picked up from the suction well and pumped to the air removal tank where a constant overflow is maintained back to the suction well. The feed to the clarifier is taken off below the surface and regulation of the flow is carried out by a valve between the headbox and the clarifier. Distribution of the influent is through the circular ring underneath the main bottom baffles at six equidistant points around the circumference of the distributor. The clarified water flows into the collectors and from there into the weir box. Adjustment of this weir to allow a slight overflow of clear water back to the suction well gives any decided quantity of clarified water to the kraft pulp mill where it is used just as if it were fresh water. The sludge withdrawal piping shown in the cross section takes out of the concentrator section at eight equidistant points around the circumference of the concentrator. Figure 6 is an external view of the clarifier. The small house right by the steps which is not shown on the

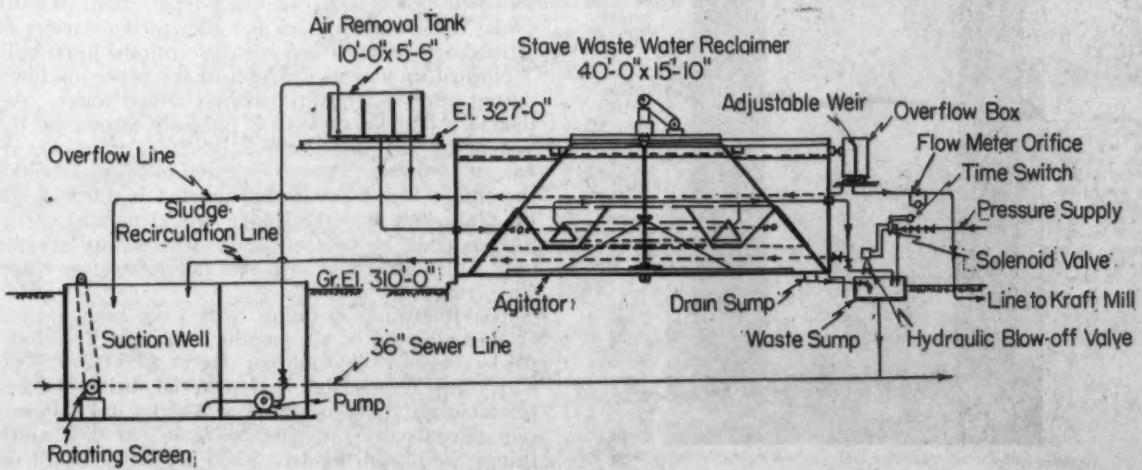

FIG. 5
Flow Diagram of Commercial Unit

flow diagram houses the flow meter and a chlorinator which is used for sterilization of the entire system. The blow down valve mechanism consists of a time clock, solenoid valve, and hydraulic valve to desludge the concentrator section for 2 minutes on a 20-minute cycle. A 2-inch line is tied in just above the gate valve on the blow down piping to allow a small amount of recirculation of the sludge back to the suction well. Figure 7 illustrates the results of typical operation of the clarifier. The tubes from left to right are grab samples taken during normal operation of the influent to the clarifier, the effluent from the clarifier, and the sludge blow down. At the time these samples were taken, the unit was running at 1200 gallons per minute and no flocculating agents or chemicals of any kind had been fed to the system. No extraneous chemicals or materials are used to aid clarification of the suspended pulp present in the influent. The results from hundreds of tests made hourly on the operation of the clarifier show that the average influent will contain some 2 or 3 pounds per thousand gallons of filterable solids and that the effluent will contain 0.1 pounds per thousand gallons or less. The sludge blowoff will average about 50 pounds per thousand gallons.

The filterable solids present in the main sewer consist mainly of groundwood fines originating as white water leaving the groundwood mill and news machine. There are also unbleached kraft fibers present which come from the cylinder machine turning out pulp. The usual ratio of groundwood to chemical pulp is about two to one.

Operating Experiences

When the unit was first started up in December of 1943, it was found that the effluent contained as high as 1 pound per thousand gallons of suspended solids which proved to be groundwood rejects from the secondary screens in the groundwood mill. It was soon found that these coarse rejects did not have the property of self-flocculation on large scale operation, and they were accordingly diverted to a sewer that bypassed the clarifier entirely. The amount of water bypassed was small and of no consequences to the operation as a whole. During the initial periods of starting up the clarifier, various speeds of agitation were employed, and it was found that the speed of agitation had no bearing on the operation of the clarifier. Intermittent desludging versus continuous desludging was studied but it was found that the intermittent desludging was preferable as the relatively large volume of water blown out in a relatively short period of time gave high velocities within the concentrator section which acted to scour the bottom and thus keep the concentrator free and the pulp in a fluid condition.

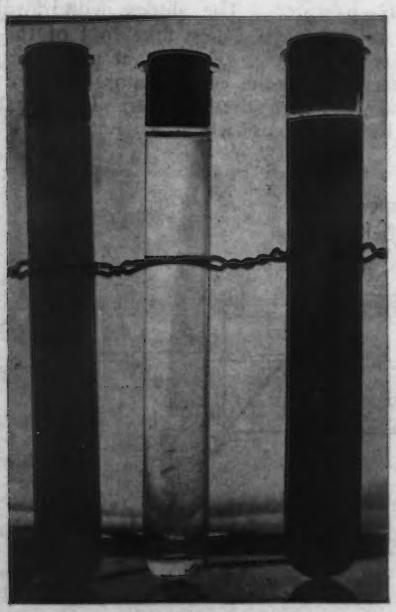

FIG. 7
Samples Taken during Operation—A. Influent to Clarifier. B. Effluent from Clarifier, and C. Sludge Blow-Down.

After about 2 months operation, it was noticed that profuse slime growths were coating the collecting troughs and stopping up the holes with a consequent reduction in flow. A chlorinator was installed and chlorine injected at two points. Approximately 150 pounds of chlorine per day was injected into the riser leading to the air removal tank and approximately 50 pounds per day was injected into the clarified water at the adjustable weir box in order to protect the kraft pulp mill from slime infection. The chlorine application was found to be completely satisfactory and, in this particular case, was superior to any other type of slime prevention.

After the technical service department had operated the clarifier for some 6 months, and the initial difficulties disposed with, the operation was turned over to the pulp and paper mill operating crews. The unit was included as part of the mill water system, and as it had been found that an operator was not required in continuous supervision; the auxiliary fireman from the power house makes a tour of inspection every 4 hours to see that the motors and pumps are running, checks the bearings, and sees that the desludging system is working. As the feed to the clarifier comes from the groundwood and newsprint mills, and as the effluent from the clarifier is utilized by the kraft pulp mill, the two mills work in cooperation to operate the clarifier in the event that something goes wrong and the unit must be shutdown, started up, etc. On a few occasions, the effluent from the clarifier has become contaminated with pulp from the sludge blanket and this was immediately noticed by the operators in the kraft mill washroom. On these occasions, the pulp mill tour boss merely switched from clarified water to the fresh water system and allowed the clarifier to settle down before it was cut back into the kraft mill.

Normal shutdowns of either of the paper machines do not affect the quality of the clarified water. Although a large stock load is suddenly thrown on the system by the dumping of headbox, wire pit, or vats, it is of short enough duration to be absorbed by the sludge bed. Try cocks inserted in the side of the tank show that the sludge bed in normal operation extends about two-thirds of the way up the tank, although it may rise and fall a few feet either way from time to time.

The following operating costs have been arrived at over a period of six months operation. Two hundred pounds of chlorine per day at $3.50 and $1.00 a day for repair labor and material, bring the expendable materials to a total of $4.50 a day. Power requirements are estimated at $2.36 per day which brings the overall total to $6.86 per day. Based on 1000 gallons per minute, the resulting cost is $0.51 per thousand gallons.

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New York Paper and Pulp Market Review

More Paper For Home Front Consumption Is Gradually Being Expanded—Wood Pulp Allocation May End Soon—More Waste Paper Needed To Maintain Paperboard Output — Rags Active.

Office of the PAPER TRADE JOURNAL,
Wednesday, August 15, 1945.

More paper for civilian consumption is indicated in easement of existing WPB limitation orders. News print appears to be excepted for the current third quarter because of large foreign commitments. In general, supply is expected to improve materially for normal trade distribution. A more rapid movement back to normalcy than some opinion has expressed, is looked for in several quarters of the paper market. On August 13 the WPB relaxed orders on book, groundwood and five types of paper, which will increase consumption quotas of established publishers generally to 5% of the base period consumption. A much more liberal provision than this is also anticipated reasonably soon, certainly in the fourth quarter.

The index of general business activity for the week ended August 4 declined to 139.1, from 140.4 for the preceding week, compared with 144.8 for the corresponding week in 1944. The index of paperboard production was QTW.T, compared with 154.2 for the preceding week, and with 159.3 for the corresponding week in 1944.

Paper production for the week ended August 4 was estimated at 93.6%, compared with 89.8% for 1944, with 89.5% for 1943, with 81.4% for 1942, and with 99.7% for the corresponding week in 1941.

Paperboard production for the week ended August 4 was 93.0%, compared with 96.0% for 1944, with 94.0% for 1943, with 75.0% for 1942, and with 91.0% for the corresponding week in 1941.

Paper production for June aggregated 1,476,082 tons, compared with 1,460,305 tons in June 1944, and with 1,513,441 tons in May, 1945.

Pulpwood

Pulpwood receipts at the mills continue encouragingly high, although domestic receipts in the first half of this year were about 1% under 1944 and the goal for 1945 is 4% greater than last year's receipts. June receipts were 1,406,000 cords, compared with 1,344,000 cords in June, 1944. Imported pulpwood totaled 187,000 cords in June, compared with 170,000 cords in June 1944. Freight car shortage in the future may hamper the movement of pulpwood to the mills.

Wood Pulp

Pulp and paper mills were advised in July that third quarter deliveries or consumption were under revision. In consequence, withholding of wood pulp from integrated mills was reduced by two-thirds; in the case of white pulps, from 10 to 33 1/3%, and in unbleached sulphate from 15 to 5%. The Department of Commerce industry report, just issued, points out that, "it is well for the industry to keep in mind that pulp allocation will not continue indefinitely. Consequently, mills should already be planning their pulp purchases and consumption against the day when Order M-93 will be revoked. With this end in view, it is the intention of the Pulp Allocation Office not to increase market pulp consumption during the third quarter beyond the new level, but to use any additional pulp imports insofar as possible to build inventories to a basis which will promote the relaxation and eventual revocation of Order M-93."

Mill receipts of rags for June totaled 33,000 tons, compared with 36,000 tons for May, 1945, with 41,000 tons on 1944 and with 36,000 tons in June, 1943. Consumption was 35,000 tons in June, 1945, compared with 36,000 tons in 1944 and with 33,000 tons in June, 1943.

Mill demand for cotton cuttings continues active. Reports indicate a somewhat more acute situation in the supply of the high grades of cotton cuttings. Prices are strong at ceiling levels.

Demand for old cotton rags continues very active under the heavy requirements for roofing papers. All grades of roofing rags are in heavy demand at ceiling levels.

Old Rope and Bagging

No change of importance has been reported in the old rope market this week. Demand for Manila rope is heavy and supplies continue well under demand.

Demand for scrap bagging is reported limited and buying in very light volume, at this date. No. 1 gunny continues to be reported as active. Prices continue unchanged.

Old Waste Paper

Mill receipts of paper stock in June, 1945, totaled 590,000 tons, compared with 632,000 tons in May, and with 597,000 tons in June, 1944. Consumption was 594,000 tons in June, 1945, compared with 614,000 tons in May, and with 593,000 tons in June, 1944.

Mill demand for waste paper is reported heavy and as urgent as ever to meet essential requirements. All grades of paper stock are in heavy demand, the market is strong and prices are firm at ceiling levels.

Newsprint Production Gains

Production in Canada during July 1945 amounted to 270,640 tons and shipments to 282,065 tons, states the release of the News Print Service Bureau on August 13. Production in the United States was 57,081 tons and shipments were 58,311 tons. The output in Newfoundland was 26,831 tons and shipments were 32,415 tons making a total North American production of 354,552 tons and shipments of 372,791 tons. Total production in July 1944 was 326,083 tons and shipments were 339,904 tons.

The Canadian mills produced 90,308 tons more in the first seven months of 1945 than in the first seven months of 1944, which was an increase of 5.2%. The output in the United States was 12,843 tons or 3.1% more than in the first seven months of 1944; in Newfoundland production was 41,473 tons or 27.9% more, a total increase of 144,624 tons.

Stocks of newsprint paper at the end of July were 86,297 tons at Canadian mills, 9,509 tons at United States mills, and 49,831 tons at Newfoundland mills, making a combined total of 145,637 tons compared with 163,876 tons on June 30, 1945, and 117,135 tons at the end of July 1944.

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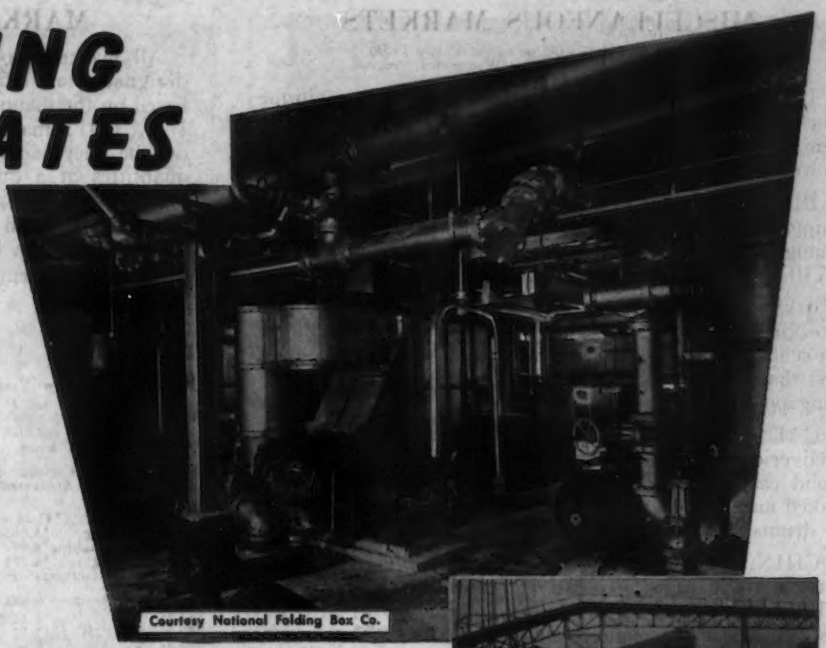

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MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, August 15, 1945.

BLANC FIXE—Quotations on blanc fixe continue unchanged. Demand is reported fair. The pulp is currently quoted at $40 per ton, in barrels, at works; the powder is currently quoted at $60 per ton, f.o.b. works.

BLEACHING POWDER—Current demand active. Supply situation reported good. Quotations continue unchanged. Prices on bleaching powder range from $2.50 to $3.10 per 100 pounds, in drums, car lots, at works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 24 cents per pounds; 2,000 pounds, 24¼ cents per pound; less than 2,000 pounds, 24¾ cents per pound, f.o.b. shipping point. Imported 21 to 23 cents.

CAUSTIC SODA—Demand continues very heavy. Deliveries continue delayed. Supply tight in dry grades. Solid caustic soda is quoted at $2.30 per 100 pounds; flaked and ground is quoted at $2.70 per 100 pounds; all in drums, car lots, at works.

CHINA CLAY — Quotations on china clay are unchanged. Current demand is reported fair. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mine. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Demand heavy with essential requirements met. Brightness of paper attained by chlorine revoked. Quotations unchanged. Chlorine is currently quoted at $1.75 per 100 pounds, in single unit tank cars, f.o.b. works.

ROSIN—No offerings or sales. "G" gum rosin is quoted at $6.74 per 100 pounds, in barrels, at Savannah; "FF" rosin at $6.70 per 100 pounds in barrels, at New York; seventy per cent gum rosin size at $6.95 per 100 pounds, f.o.b. works.

SALT CAKE—Prices on salt cake are reported unchanged for the current week. Consumption is reported moderate at this date. Domestic salt cake is quoted at $15 per ton, in bulk. Chrome salt cake is quoted at $16 per ton. All prices in car lots, f.o.b. shipping point.

SODA ASH—Heavy demand continues for all-over requirements. Bulk lot shipments steady. Bagged lots still slow. Quotations continue unchanged. Current prices, car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Current corn receipts are light this week and demand is active. Prices firm at this date. Starch prices continue unchanged. The pearl grade is quoted at $3.72 per 100 pounds; powdered starch at $3.83 per 100 pounds; all prices in bags, car lots, f.o.b. Chicago.

SULPHATE OF ALUMINA — Demand reported good. Quotations continue unchanged. The commercial grades are quoted at from $1.15 to $1.25 per 100 pounds, in bags, car lots, f.o.b. works. The iron free is currently quoted at $1.75 per 100 pounds, in bags, at works.

SULPHUR—Quotations on sulphur continue to conform to prevailing market prices. Demand active. Annual contracts are quoted at $16 per long ton, f.o.b. mines; the price at Gulf Ports is $17.50 per long ton.

TALC—Prices on talc continue unchanged. Demand good. Domestic grades are currently quoted at from $16 to $21 per ton at mines; Canadian at $24 per ton. All prices in car lots.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

Standard News, per ton—			
Roll, contract	*$61.00	@	—
Sheets	69.00	@	—
* OPA Maximum Price.			
Kraft—per cwt.—Carload Quantities Zone A, Delivered			
Superstandard Wrapping	*$5.25	@	—
No. 1 Wrapping	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard Bag	*4.375	"	—
* OPA Manufacturers' Prices.			
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½	1.00	"	—
White No. 2	.90	"	—
Anti-Tarnish M.F.	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.20	"	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	11.25	@	—
No. 1 Manila Wrapping, 35 lb.	6.00	"	6.25
No. 2 Manila Wrapping, 35 lb.	5.75	"	6.00
Boards, per ton—			
News	*50.00	@	—
Chip	*50.00	"	—
Sgl. Mia. L1. Chip	*62.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*63.00	"	—
Binders Boards	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$39.10@$46.00	$40.25@$47.25
100% Rag	32.20 " 37.75	33.35 " 39.25
85% Rag	.... "	29.90 " 35.00
75% Rag	23.00 " 27.00	24.15 " 28.25
65% Rag	.... "	22.80 " 27.75
50% Rag	18.70 " 22.75	19.90 " 24.25
25% Rag	16.40 " 20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$10.55@$12.75	$11.70@$14.25
No. 2	9.65 " 11.75	10.80 " 13.25
No. 3	9.20 " 11.25	10.35 " 12.50
No. 4	8.90 " 10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper. Delivered in Zone 1:

No. 1 Glossy Coated	$13.65@	$15.30
No. 2 Glossy Coated	12.40 "	14.00
No. 3 Glossy Coated	11.60 "	13.25
No. 4 Glossy Coated	11.15 "	12.75
No. 1 Antique (watermarked)	10.25 "	11.75
No. 2 Offset	9.60 "	11.00
A Grade E. F.	9.35 "	10.75
A Grade S. & S. C.	9.60 "	11.00
B Grade E. F.	8.85 "	10.25
B Grade S. C.	9.10 "	10.50
C Grade E. F.	8.55 "	9.75
C Grade S. C.	8.80 "	10.00
D Grade E. F.	8.25 "	9.50
D Grade S. & S. C.	8.50 "	9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight Not Exceeding OPA Allowances.

Bl. Softwood Sulphite	$86.00
Unbl. Softwood Sulphite	74.00
Bl. Hardwood Sulphite	83.50
Unbl. Hardwood Sulphite	71.50
Bl. Mitscherlich	81.00
Unbl. Mitscherlich	72.00 @ 82.00
N. Bleached Sulphate	86.00
S. Bleached Sulphate	79.00
N. Semi-Bleached Sulphate	82.00
S. Semi Bleached Sulphate	75.00
N. Unbl. Sulphate	73.00
S. Unbl. Sulphate	63.50
Bl. Soda	76.00
Unbl. Soda	72.00
Groundwood	50.00

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50

	50%-80% Air Dry Weight
Northeast	11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices

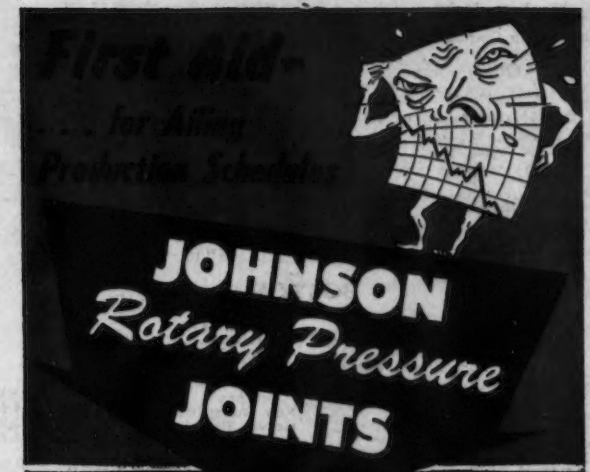
Domestic Rags

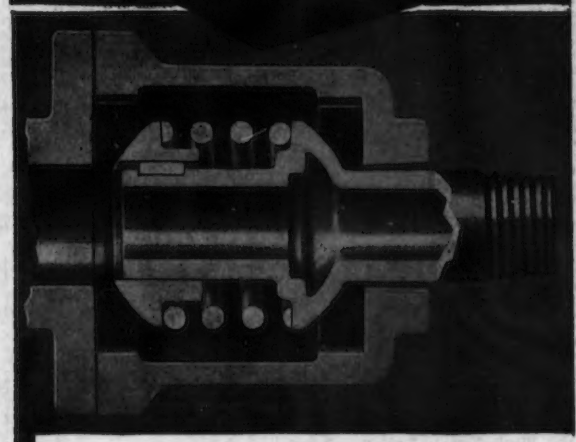
New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.50	@	7.25*
Silesias No. 1	—	"	5.75*
New Unbleached	6.75	"	7.50*
Blue Overall	—	"	5.50*
Fancy	—	"	3.50*
Washables	—	"	3.00*
Bleached Khaki Cuttings	—	"	4.25*
Unbleached Khaki Cuttings	—	"	3.50*

*OPA Maximum Prices



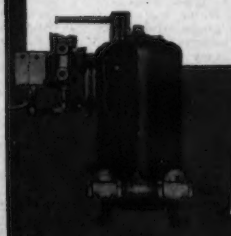


● It's true in many cases — the most effective single step you can take to speed up lagging production is to switch over to Johnson Joints.

Their packless, self-oiling, self-adjusting, self-aligning design ends all the troubles of the old style stuffing boxes and steam fits. Precious man-hours can be released for other tasks. Efficiency-boosting methods of syphon drainage can be employed more satisfactorily.

Yet with all these benefits, the Johnson Joint can pay its own way out of savings in maintenance alone. That's the verdict of hundreds of mills, where scores of thousands of Johnson Joints are helping to meet today's unprecedented demand.

WRITE FOR COMPLETE INFORMATION



Don't overlook the JOHNSON ELECTRAP

It's replacing expensive pumps and cumbersome tilting traps . . . draining lines under vacuum as complete as 27 inches of mercury. Electrical method of operation brings greater capacity, absolute dependability, and permits remote control for those hard-to-get-at installations.

The Johnson Corporation

828 WOOD STREET THREE RIVERS, MICHIGAN

BAUER PULPER INSTALLATIONS

Produce long, pliable, free fiber. From many different raw material sources for almost every grade of finished output. The tabulation of actual mill applications below will interest you—give you a clear picture of the range of stocks being successfully pulped with Bauer equipment.

Raw Chips from Logs or from Wood Waste, Slabs, Edgings, Tree Tops, Veneer Waste.

Steamed Chips.
Semi-Chemically Cooked Chips.

Extracted Chestnut Chips.
Extracted Pine Stump Chips.

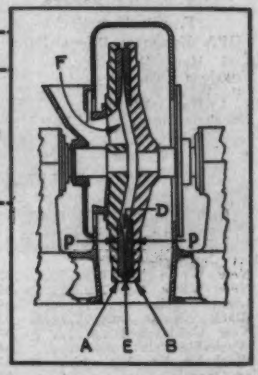
Groundwood Bull Screen Rejects
Groundwood Knotter Screen Rejects
Groundwood Fine Screen Rejects

Kraft Knotter Rejects
Kraft Screen Rejects

Sulphite Screen Rejects

Waste Printed Papers; Ledgers
Waste Wet Strength Papers
Waste Corrugated Papers
Waste Papers in General

Bagasse Fiber
Licorice Root Fiber
Bamboo Fiber



Stock enters at F; passes between plates PP, positioned between disks A and B . . . and is discharged at E.

THE BAUER BROS. CO.
SPRINGFIELD, OHIO

Bauer Pulpers are in service in: The United States, Canada, Mexico, Hawaii, New Zealand, Australia, India, Sweden and Russia.

Old Rags

White, No. 1—			
Repacked	*3.80	"	—
Miscellaneous	*3.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Thirds and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.30	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

Pre-War Quotations

All Prices Nominal

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.25	@	3.30
Wool Tares, light	3.25	"	3.50
Wool Tares, heavy	3.50	"	3.75
Bright Bagging	3.25	"	3.50
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	5.50	"	—
No. 1 Sisal Strings	*4.00	"	—
Mixed Strings	2.00	"	—

* OPA Maximum Prices.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½ @	—
No. 1 Hard White Envelope Cuts	3.12½ "	—
No. 1 Hard White Shavings, ruled	2.50 "	—
Soft White Shavings, one cut	2.87½ "	—
No. 1 Soft White Shavings	2.50 "	—
Soft White Shavings, Misc.	2.15 "	—
No. 1 Fly Leaf Shavings	1.67½ "	—
No. 2 Fly Leaf Shavings	1.12½ "	—
No. 1 Groundwood Fly Leaf Shavings	1.25 "	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90 "	—
Mixed Colored Shavings	.75 "	—
Mixed Groundwood Colored Shavings	.90 "	—
Overissue Magazines	1.67½ "	—
No. 1 Heavy Books & Magazines	1.92½ "	—
Mixed Books	1.10 "	—
No. 1 White Ledger	2.30 "	—
No. 2 Mixed Ledger, colored	2.00 "	—
New Manila Envelope Cuttings, one cut	2.87½ "	—
New Manila Envelope Cuttings	2.65 "	—
Extra Manilas	1.95 "	—
Mixed Kraft, Env. & Bag Cuttings	2.75 "	—
Kraft Envelope Cuttings	3.25 "	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50 "	—
New 100% Kraft Corrugated Cuttings	2.25 "	—
No. 1 Assorted Old Kraft	1.75 "	—
New Jute Corrugated Cuttings	.90 "	—
Old 100% Kraft Corrugated Containers	1.75 "	—
Old Corrugated Containers	1.40 "	—
Box Board Cuttings	.72½ "	—
White Blank News	1.65 "	—
Overissue News	1.10 "	—
No. 1 News	1.00 "	—
No. 1 Mixed Paper	.95 "	—
Old Corrugated Containers	.82½ "	—
Mill Wrappers	1.10 "	—

Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17¼	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—

(Hard Fiber)

Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila	—	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill)

Shirt Cuttings—	
New White No. 1	.07¼
New White No. 2	.05¾
Light Silesias	.05¾
Black Silesias, soft	.03¾
New Unbleached	.07½
Washable Prints	.04¼
Washable No. 1	.03
Blue Overall	.05½
Cottons—According to grades—	
Washable Shredding	.01¾
Fancy Percales	.04¾
New Black Soft	.03¼
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.03½
Bleachable Cotton Cuttings	.04¼
Men's Corduroy	.03½
Ladies' Corduroy	.03
Cottonades	.03¼

Domestic Rags (Old)

White No. 1—Repacked	3.80	@	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
White No. 2—Repacked	2.90	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	@	3.50
No. 1 Clean bright—			
Sisal Strings	.04	"	—
No. 2 Clean bright—			
Sisal Strings	.03	"	—
Sisal Jute	.02½	"	.02¼
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.25
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila.)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Ledger, colored	2.00	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Box Board Cuttings	.72½	"	—
Kraft Corrugated Cuttings	2.25	"	—
Old Corrugated Containers	1.40	"	—
Overissue News	1.00	"	—
No. 1 News	1.00	"	—

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices, Baled

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	2.25	"	—
Ground Wood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Overissue News	1.10	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	2.75	@	2.90
Sisal Rope No. 1	*4.75	"	—
Sisal Rope No. 2	* —	"	4.00
Mixed Rope	—	"	1.55
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	4.50	"	5.00
Jute Carpet Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.00	"	3.25
South American	—	"	3.25
Wool Tares—			
Foreign	(nominal)		
Domestic	4.25	"	—
Aust. Wool Pouches	—	"	3.65
New Zealand Wool Pouches	—	"	3.50
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.25
Paper Mill Bagging	2.50	"	3.00
No. 2 Roofing Bagging	1.35	"	—

* OPA Maximum Prices.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	@	.04¾
Fancy Percales	.04¼	"	.05
New White No. 1	.06¾	"	.07
New Light Flannelettes	.05½	"	.06
Canton Flannels, Bleached	.06	"	.06¼
Underwear Cutters, Bleached	.06¼	"	.06¼
Underwear Cutters, Unbleached	.05¾	"	.06
Silesias No. 1	.06	"	.06¼
New Black Silesias	.03	"	.03¾
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.06½	"	.06¾
Blue Cheviots	.05½	"	.06
Fancy	.02¾	"	—
Washable	.02¾	"	—
Khaki Cuttings	.02¾	"	.03
O. D. Khaki	.03½	"	.03¾
Corduroy	.03¼	"	.03½
New Canvas	.06¼	"	.06½
B. V. D. Cuttings	.06¾	"	.06½

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—*
Miscellaneous	3.20	"	—*
White No. 2—			
Miscellaneous	2.65	"	—*
Twos and Blues, Repacked	2.20	"	—*
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—*
Miscellaneous	1.80	"	—*
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—*
No. 2	1.45	"	—*
No. 3	1.35	"	—*
No. 4	1.35	"	—*
No. 5, Quality A	1.35	"	—*
Quality B	1.20	"	—*
Quality C	.95	"	—*
Old Manila Rope	5.75	"	—*

* OPA Maximum Prices.

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.30	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
No. 1 Roofing Rags	1.55	"	—
No. 1 Roofing Bags	1.45	"	—

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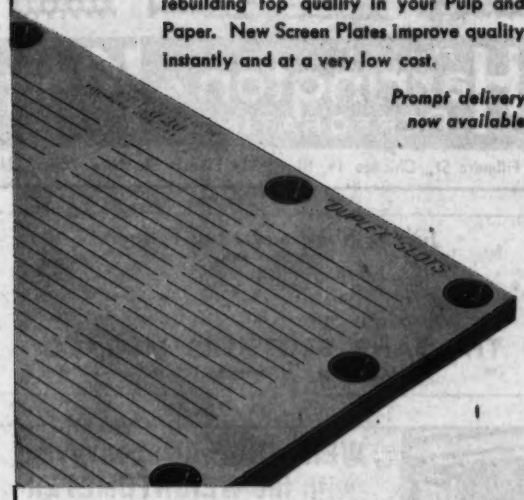

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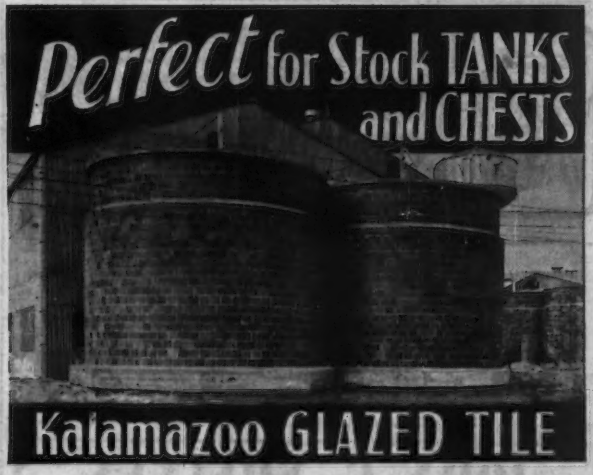

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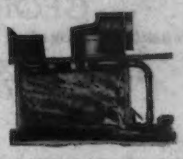
If you want complete details on equipment for your paper mill or woodroom, please ask for it. You'll be interested in our new developments.

Illustrated here are only 2 of a wide line of paper mill and woodroom equipment—a pulp wood chipper and the new pulp stock agitator.



Other equipment:
Pulp wood chippers; multiple knife discs; pulp wood slashers; flat screens; chip crushers; knot saws; knot drills; wood cleaners; roll heading machines; windershafts.

GRID Unit Heaters and Blast Sections, made with high test cast iron "fin" heating sections. Also, power forging hammer for maintenance work around the mill.

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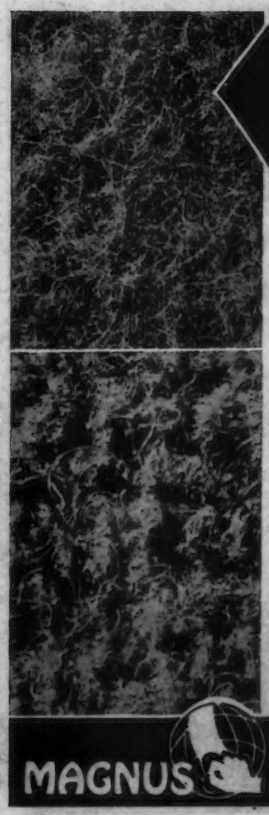

The Reconditioned Felt's Ready for *FAST ROLLING*

You wouldn't want to depend on the loaded felt shown below to get production speed from your machines. But you can see that the reconditioned felt is ready to do about as good a job as when it was new!

Magnus Felt Reconditioners

are designed not only to clean a felt, but to put it in condition to do what it did when new . . . with its softness restored and its nap full.

There is a Magnus Felt Reconditioner to suit your problems of loading and operation . . . from Magnus Feltex, for ordinary machine felts with the usual type of loading, to Magnus D-Scale-R, for putting badly limed felts back into top-notch condition. There are types for conditioning felts on the machine and off, as well as those that help break in a new felt on the machine.

May we send samples for trial?

MAGNUS
MAGNUS CHEMICAL COMPANY
24 SOUTH AVENUE, GARWOOD, N. J.
Paper Mill Cleaners

CHAS. T. MAIN, INC.
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Complete Service
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BROAD EXPERIENCE IN MANUFACTURE OF PULP AND PAPER
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Paper & Pulp Mills — Steam Power Plants
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ARE YOU READY FOR "V" DAY?
Prepare NOW to Take Care of Increased Orders Which Will Come. Consider Necessary Repairs and Maintenance.
Also New Equipment of Improved Designs and Efficiency.
PAPER BAG MACHINERY—PAPER MACHINES
THE NEW MODEL "E" PAPER TRIMMERS
THE SMITH & WINCHESTER
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INDUSTRIAL TYCOL OILS-GREASES
A COMPLETE LINE
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THE CORROSION RESISTANT ALLOY
CAST • ROLLED • FABRICATED
for all equipment exposed to corrosion by sulphite acids
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PERFORATED METAL SCREENS
MADE SPECIALLY FOR PAPER and PULP MILL USE
Copper, Bronze, Steel, Stainless Steel and other metals, Heat-treated
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For High-Speed, Dependable
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POTDEVIN
Paper Bag Machines, Aniline & Oil-Ink Presses, Waxing, Gluing, Varnishing, Laminating Machines.
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HOW OAKITE CLEANING HELPS MILLS ECONOMIZE ON MAINTENANCE!

Low-Cost Slime Control In Humidifying Systems

Oakite Airfiner No. 52, a recent development of the Oakite Research Laboratories, is proving particularly useful in controlling slime formation in humidifying systems. Many mills now using this additive find it an effective answer to maintaining peak humidification.

Solutions of Oakite Airfiner No. 52, applied as directed, not only successfully combat slime and mold, they also inhibit the formation of hard water scale in atomizers, drains and return lines. Oakite Airfiner No. 52 is odorless, non-toxic . . . solutions may be injected directly into waterways during working hours with no discomfort to personnel. Let us send you full details. No obligation, of course.

OAKITE PRODUCTS, INC. 46A Thames St., NEW YORK 6, N. Y.
Technical Service Representatives in All Principal Cities of the United States & Canada

OAKITE CLEANING — Buy Bonds for Victory — MATERIALS METHODS SERVICE — FOR EVERY CLEANING REQUIREMENT

FIBRE MAKING PROCESSES INC.

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WOOD PULP & PAPER AGENTS

for domestic and export

60 East 42nd Street, New York 17, N.Y.

Chemicals FOR PULP & PAPER

CHLORINE
CAUSTIC SODA
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*Aluminum Sulphate
Borax
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Carbon Bisulphide
Carbon Tetrachloride
Citric Acid
*Copperas
Cream of Tartar
Muriatic Acid
Nitric Acid
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Sodium Hydrosulphide
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Sulphur Chloride
*Superphosphate
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Tartaric Acid
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HELP WANTED

ASSISTANT SUPERINTENDENT

Exceptional opportunity for a young man with good educational and paper making background. Applicant should be experienced on Fourdrinier & Cylinder Yankee machines making light weight, creped tissues.

List experience, references and personal data in first letter. All correspondence strictly confidential. Our employees have been notified of this advertisement.

Address replies to Box No. 45-470 care Paper Trade Journal. A-16

HELP WANTED

For New Mill in Mexico making nine point straw:

3 Tour Bosses
3 Machine Tenders
3 Beater Men
1 Superintendent

Address Box No. 45-462 care paper Trade Journal. A-30

A large Northeastern pulp and paper manufacturer has attractive openings for several chemists or chemical engineers with sound technical backgrounds and experience in the development aspects of the manufacture and conversion of pulp and paper. Address Box 45-465 care Paper Trade Journal. A-23

WANTED

TOUR BOSS, MACHINE TENDER, SHIPPING CLERK. Board Mill located in Northeastern Pennsylvania, making Folding Grades.

Extensive plans for expansion under way.

Excellent post-war future assured. Permanent jobs, good chances for advancement for the right men.

Only men looking for permanent connection and steady work need apply. Box 45-411 care Paper Trade Journal. A-23

CHEMIST with organization ability and initiative for responsible position in quality control work with Midwest manufacturer of packaging materials. Background in resing desirable. Address Box 45-428 care Paper Trade Journal. A-16

WANTED—BEATER ENGINEER—Mid-western mill making high grade rag content bond and ledgers wishes beater engineer with sufficient experience to supervise beating of rag and sulphite. Permanent position for man with right qualifications. Address Box 45-442 care Paper Trade Journal. A-16

WANTED—We need a graduate chemist in our expanding product development laboratory who has a background of paper chemistry and is familiar with all types and kinds of paper coatings including resins and lacquers. Address Box 45-398 care Paper Trade Journal. A-16

WANTED—CHIEF CHEMIST for pulp and paper mill located on Pacific Coast. Apply in own handwriting giving references, experience and other pertinent information. Address Box 45-243 care Paper Trade Journal. TF

WANTED—A recent college graduate in paper chemistry to work in our laboratory on paper coating compounds and heat sealing compounds. Address Box 45-397 care Paper Trade Journal. A-16

MACHINE TENDER for cylinder machine operations. Must be experienced at this particular kind of machine operations. Prefer high school graduate or equivalent. Address Box 45-293 care Paper Trade Journal. TF

WANTED—Two Paper Sheet Cutter Machine Operators for Book and Specialty Mill. Address Box 45-440 care Paper Trade Journal. A-23

TOUR BOSS wanted for mill in South America. Must have experience on cylinder and fourdrinier machines making tissue, faced boards, corrugating medium and liners. Address Box 45-452 care Paper Trade Journal. A-23

HELP WANTED

CHARLES P. RAYMOND SERVICE INC.
294 Washington St., Boston, Mass.
Specializing in Paper Mill Personnel
Positions Now Open

Plant engineers exp. design paper, pulp and board mills
Manager molded pulp manufacturing
Manager two-machine paper mill
Salesmen and sales managers
Laboratory men, chemists, technical directors
Draftsmen and designers
Tour bosses, machine and back tenders
Master Mechanics
And many others.

We invite correspondence (strictly confidential) with employers seeking personnel and men seeking new positions. A-16

PAPER BAG ADJUSTORS

Flat and Square, Specialty Bags, Aniline Printing. Excellent opportunity for steady, well-paying future. Plant located in South. Write full details. Confidential. Box No. 45-478 care Paper Trade Journal. A-30

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HELP WANTED—5c a word. Double rate for heavy face type. Minimum charge $1.25.

SITUATIONS WANTED—5c a word, double rate for heavy face type. Minimum charge $1.25. If repeated ½ rate will be charged for each consecutive repetition.

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PAPER TRADE JOURNAL
15 West 47th Street
New York 19, N. Y.

HELP WANTED

Paper Bag Machine ADJUSTORS

Flat, Square, Shipping Sacks or Self-Opening. Top wage rates, rapid advancement, good future for experienced man. Write, giving full details. Our employees know of this ad. Location, New York City, Box No. 45-477 care Paper Trade Journal. A-30

SALARIED POSITIONS $2,500-$25,000. Post-war plans are creating lifetime opportunities now. This thoroughly organized confidential service of 35 years' recognized standing and reputation carries on preliminary negotiations for supervisory, technical and executive positions of the calibre indicated, through a procedure individualized to each client's requirements. Several weeks are required to negotiate and each individual must finance the cost of his own campaign. Retaining fee protected by refund provision. Identity covered and present position protected. Plan now for post-war security. Send only name and address for details. R. W. BIXBY, INC., 117 Delward Bldg., Buffalo 2, N. Y. TF

CHEMIST or CHEMICAL ENGINEER for technical service work in midwestern kraft, sulfite and paper mill. Permanent. Persons with some experience preferred but not essential. Answers should contain all necessary information on education, experience, references, salary desired, etc. Address Box 45-453 care Paper Trade Journal. A-16

WANTED—Young graduate chemist or chemical engineer to be trained for technical sales service. Good opportunity with old well-established company. Good starting salary. Give full particulars first letter. Address Box 45-459 care Paper Trade Journal. A-16

CHEMICAL Company in metropolitan New York area has opening for a chemist familiar with the problems of paper coatings and finishes involving resins. Address Box 45-460 care Paper Trade Journal. A-30

TOUR Bosses, Machine Tenders and Backtenders wanted by tissue mill near New York City. Men familiar with the manufacture of facial tissue and two ply toilet tissue will be given preference. Reply in hand writing, listing work experience. Our men have been informed of this advertisement. Address Box 45-471 care Paper Trade Journal. A-16

WANTED — ENGINEERS — Capable of handling general engineering work in established consulting engineers office specializing in pulp and paper mills. Address Box 45-469 care Paper Trade Journal. TF

SALESMAN WANTED—Excellent opportunity for men who have following with large industrial firms within 50 mile radius of New York. Write full particulars for interview. Address Box 45-481 care Paper Trade Journal. A-16

PLANT ENGINEER with long experience in construction and maintenance of pulp and paper mills and operation of Electro-chemical and Power Plants. Address Box 45-483 care Paper Trade Journal. A-23

SITUATIONS WANTED

PURCHASING AGENT

If you are looking for a capable, honest and aggressive purchasing agent to handle selection of suppliers, expediting, disposal of surplus, initiating use of new materials, inventories, material control, acceptance, subcontracting, traffic and inspection kindly contact box 45-424 care of Paper Trade Journal. A-16

MARKETING EXECUTIVE. High grade man with broad background, who is able to work in dual capacity; having, also, wide experience in paper manufacturing. College education. Age 44. Location immaterial. Address Box 45-436 care Paper Trade Journal. A-16

MILL ORGANIZATION CHART

OF INTEREST TO KEY MEN IN ALL POSITIONS

Are You A Key Man in Your Mill? If so, Here is A Message For You.

EXECUTIVE OFFICE	Black-Clawson can serve top management as:	Councilors on mill expansion problems. On ways to cover conversion costs; on equipment for production of new grades.
MILL MANAGEMENT	Black-Clawson works with the General Manager on:	Ways to make mill more efficient at present capacity; ways to step up capacity; ways to cut cost of conversion.
RESEARCH	Black-Clawson serves the Chemist on stock control by:	Installing preparation equipment to hold stock uniform; by cooperating on development of new grades or improvement of present one.
MILL ENGINEERING	Black-Clawson cooperates with the Chief Engineer by:	Suggesting improved mill layouts based on experience in other mills; furnishing Scale Templets of Equipment, Slide Rules for Ready Calculations.
PURCHASING	Black-Clawson aids the Purchasing Agent in many ways by:	Responding promptly on requests for estimates; quoting fair prices; and suggesting other material and supply sources.
PRODUCTION	Black-Clawson backs the Superintendent at every turn by:	Providing him with the latest in high production and special equipment based on long experience with his problems and needs.
SALES	Black-Clawson strengthens the hand of Sales Manager by:	Helping mill to supply him with quality papers and at lowest possible cost per ton.
MAINTENANCE	Black-Clawson lightens load of the Millwright:	Because B-C equipment is invariably built sturdy and less likely to cause trouble or break down; equipment easy to oil and service.
FINANCIAL	Black-Clawson a friend of the Treasurer's office:	Because B-C equipment makes for better grades, more saleable papers, less costly papers to produce, hence profitable over all operation.

THE BLACK-CLAWSON CO., Hamilton, Ohio

Divisions: Shartle Bros. Machine Co., Middletown, Ohio. Dilts Machine Works, Fulton, N. Y.
Associate: Alexander Fleck, Ltd., Ottawa, Canada.

SITUATIONS WANTED

FINISHING & SHIPPING CONSULTANT

If you are interested in increased output, lower costs per ton, reduced waste, and greater efficiency in your finishing and shipping department I can help you. Results positively guaranteed. Nominal fee. Address Box 45-479 care Paper Trade Journal. A-30

FOREMAN FINISHER or Converting Plant Supervision—Years diversified experience, Tissue, Wrapping, Bond, Envelope, Waxed Papers, etc., proficient operator instructor, Sheeting, Winding, Trimmer, Scheduling, Shipping, Warehousing etc. Address Box 45-441 care Paper Trade Journal. A-23

MANAGER or Assistant—Technical graduate. Eighteen years excellent diversified experience technical control, development and operation of pulp, paper and board mills. Now employed. Address Box 45-449 care Paper Trade Journal. A-16

SUPERINTENDENT—20 years experience in paper bag conversion of grocery, sacks and aniline or oil ink specialty bags. Capable of handling all bag shop problems. Thorough experience in supervision of help, maintenance and repairing of machines. Address Box 45-450 care Paper Trade Journal. A-30

MILL REPRESENTATIVE—24 years experience in selling book and fine papers. Have managed branch mill office. Have executive and organizing ability. Would be especially interested in mill without New York representation. Address Box 45-446 care Paper Trade Journal. A-16

BEATERROOM SUPERINTENDENT or foreman, 55 years old. 35 years theoretical and practical experience on most kinds of paper. Good on color. Address Box 45-484 care Paper Trade Journal. A-30

SITUATIONS WANTED

FORESTER—Logging Superintendent—10 years experience as estimator, buyer, superintendent of large pulp operations, sawmill manager. Extensive experience truck, tractor, waterways logging. Forestry graduate, 32, family. Desire permanent connection with progressive mill. Address Box 45-458 care Paper Trade Journal. A-16

FOR SALE

REVAMPING AND BUILDING MILL AND CAN OFFER FOR SALE

One large Breaker Beater complete
One small Beater Complete
1—30" Diameter X 90" Face cylinder mold
1—8x8 Shartle Duplex plunger stock pump
1—New pair cast steel double suspension spring type beater bearings for 8" diameter journal —Noble & Wood beater roll. Never used
1—Used old style lighter beam for 8" diameter journal Noble & Wood beater
1—New reinforced design lighter beam for 8" diameter journal—Noble & Wood beater roll. Pattern No. 663. Never used.
3—200 KVA —33000-2300/4000 volts transformers
1—250 H.P. slip ring motors & controls—450 R.P.M.—3 bearing base and pulley
60—92" Face steel dryer felt rolls—1—7/16" journals
1—20" Face cast iron taper pulley—2 15/16" bore taper 31"x29½"
4—36" diameter x 83" face dryers
1—6" to 10" Cox & Sons Pipe threading machine
1—48"x48" Noble & Wood beater roll with filling installed
1—40" Noble & Wood impeller for circulation stock in beater.

A visit to the mill would prove profitable as we have many items for sale to numerous to mention. See our superintendent Mr. O. P. Fussell at our plant in Walloomsac, New York.

WALLOOMSAC PAPER MILLS, INC.
Mills: Walloomsac, New York
Main Office: 25 Vanderbilt Avenue
New York 17, New York TF

FOR SALE

FOR SALE

BEATERS
1—1000 lbs. Jones, wood tub, roll 61 x 48" Serial No. 46,924, corrugated bars ⅝" on the cutting edge, excellent condition.
1—65 x 64" Jones
1—53 x 48" Jones
1—60 x 60" Horne Patent Wood Tub
1—66 x 42" Noble & Wood
1—24 x 18" Ditts

CALENDERS
2—104" 10 roll Machine Calenders

CUTTERS
1—72" Acme with spare new Knives
2—64" Hamblet with Mace Pilers

DRYERS
24—36 x 82"
15—36 x 81" with frame work
20—42 x 74" with frame work
8—36 x 77"
5—37 x 72"

FOURDRINIERS
1—72" Fourdrinier part
1—90" Fourdrinier part, 56' wire

JORDANS
1—Noble & Wood Mamouth Jr. new filling
1—#2 Dillon, new filling

REEL
1—120" Horne
1—130" Rice Barton—2 drums

NAILING MACHINE
1—48" Morgan Nailing Machine

ROSSERS
2—Krouse

PULPERS
1—#2 Lannoye
1—#1 Lannoye

ROTARIES
2—Loring 8" x 20" with Drive and Reducing Valves suitable for 75 lbs. pressure

FRANK H. DAVIS COMPANY
175 Richdale Ave., Cambridge 40, Mass.
A-16

PAPER COATING MACHINERY — Waxing, Oiling, Gumming, Gluing, Carbon, Laboratory Coating and Treating Machines. High speed. New improvement. MAYER MACHINE COMPANY, Inc., 1155 Scottsville Road, Rochester, 11, N. Y. TF

FOR SALE

BEATERS
2—2000 lb. Holyoke Iron Tub Beaters.
1—1000 lb. Dayton Beater.
2—400 lb. Gavit—iron tub beaters.

BLOWER
1—50" Buffalo.
Various other sizes.

CALENDER STACKS
1—11-Roll 92" Face Calender Stack—complete with Drive.
1—36" 7-roll—Holyoke Machine.
1—77" 2-roll—Moore & White.

CENTRAP
1—Shartle Brothers Centrap.

CYLINDER MOULDS
1—48" Diameter x 96" Face.
8—30" diameter x 72" face.
3—30" diameter x 74" face.

DRIVES
1—D. O. James 75 H.P. Speed Reducer with couplings and motor base. Ratio 2.16 to 1. 900 RPM to 418 RPM.
1—Pulmax Drive.

DRYERS
13—60" diameter x 154" face.
1—48" diameter x 94" face.
24—36" diameter x 82" face.
1—24" diameter x 84" face. (Baby).
1—16" diameter x 84" face. (Baby).
1—36" diameter x 116" face.
2—28" diameter x 68" face.

EMBOSSER
1—28" two roll Embossing Calender.

ERKENSATORS
2—I. W. E. Erkensators—bronze construction—complete with motors, starters and distributing box.

FLAT SCREENS
2—8 plate Flat Screens.
1—18 plate Flat Screen, with scraper.
1—12 plate Flat Screen.
2—12 plate Packer Type Flat Screens with steel vats

JORDANS
1—Pony Horne Jordan. Spare New Fillings.
1—Black-Clawson Jordan (belt driven).
1—#9 Emerson Jordan—for direct connection of a motor — requires use of 400 H.P. motor.
1—Smith & Winchester.

PULP EQUIPMENT
1—84" Carthage Chipper—complete and in excellent condition.
1—32" three pocket Glens Falls Grinder (for 27" wood).
3—Rotary incinerators—9' diameter x 20' long.
4—27" four pocket Sandy Hill grinders (for 24" wood—including 1000 H.P. motor for each, starting equipment, etc.).

PULPERS
1—#2 Lannoye Pulper.
1—Jones Pulper — direct connected to 60 H.P. motor—3 phase, 60 cycle, 440 volts —forward and reverse starting.

PUMPS
1—Buffalo Pump—5500 g. p. m., direct connected to 100 H.P. Motor (50' head).
1—Shartle Brothers duplex 10 x 20 stock pump.
1—Moore & White triplex 10 x 12 stock pump.
Various sizes of Centrifugal and Plunger Pumps. Write us regarding your particular requirements.

REELS
1—2 Bowl Reel — 112" face — bowls 20" diameter.
1—2 Bowl Reel—63" face.
1—2 Bowl Reel—110" face.

REFINERS
2—#1 Claflin Refiners.

ROLLS
500—Brass tube—steel tube—rubber covered iron rolls—various sizes.

RUBBER COUCH ROLL
1—72½" Face x 9" diameter (soft rubber)

SAVEALLS
1—Shartle Bros. decker 36" diameter x 60" face, including couch roll.
1—Saveall 36" x 136" cylinder mold, anti friction bearing equipped, including couch roll.

SHREDDERS
1—#25 CRSE Mitts & Merrill Hog.
1—Gilman Shredder—used one year.

SHEETERS
1—110" Horne single knife rotary sheet cutter
1—48" Langston heavy duty chopper (this is a combination machine, combining a slitter, scorer, sheeter and chopper.)

SIZING MACHINE
1—36" Waldron sizing machine.

SLITTERS
1—114" Two drum Langston Slitter & Winder
1—110" Beloit slitter (slitter attachment only).
1—114" Two drum Kidder slitter and winder.
1—36" Koegel slitter and winder.

SUCTION BOXES
1—Nash 100" face Suction Box.
3—Brass Suction Boxes—90" drilled face.
2—Brass Suction Boxes—77½" drilled face.

SUCTION COUCH ROLL
1—Sandusky Suction Couch Roll — 18" diameter x 130" face — Complete with Sturtevant Vacuum Pump and drive mechanism.

SUCTION PRESS ROLL
1—Sandusky suction press roll, 14⅞" diameter x 68" drilled face.

WINDERS
2—65" Cameron Tensions for Winders.

J. J. ROSS CO., 250 Frelinghuysen Avenue, Newark 5, New Jersey
TEL. BIGELOW 3-3720 A-16

We are always in the market to purchase your surplus or idle machinery. What have you to offer?

FOR SALE | FOR SALE | FOR SALE

Ross Paper Machinery Co., 17 Porter Ave., Newark 8, New Jersey, Waverly 3-5675

146" Pulp Drying Machine—200 ton per day drying capacity.

Prints and additional information on request.

BEATERS
1—2500 lb. Downingtown Iron Tub
1—750 lb. Downingtown Iron Tub
2—1000 lb. Horne Iron Tub
1—1200 lb. Holyoke Wood Tub

CALENDER STACKS
1—9 Roll Lobdell 124" Warren Doctors
1—10 Roll Farrell 104" Warren Doctors
1—11 Roll Pusey & Jones 104" Warren Doctors

CONVERTING EQUIPMENT
1—Bliss Double Head Stitcher
1—Bliss Single Head Stitcher
1—Bliss Box Assembling Machine
1—66" Dietz Towel Winder
4—Waterville Grinders
1—42" Parry Liner & Combiner
1—36" Waldron Reeling Machine
1—39" Dampening Machine
1—36" Brush Coating Machine
1—Copper Mixing Tank with agitator—40 gal.
1—Cast Iron Kettle 20" x 24" 2 outlets

DRYERS
5—48" diam.—102" face—2 deck frames.
40—36" diam. 86" face 3 deck frames
18—36" diam. 82" face 2 deck frames
40—28" diam. 96" face 2 deck frames

FESTOON DRYERS
100" Proctor & Schwartz
60" Proctor & Schwartz

FLAT SCREENS
1—Moore & White 8 Plate
1—Moore & White 10 Plate
1—Sandy Hill Packer 10 Plate
2—Sandy Hill 8 Plate-Scraper
1—Trimbey Pulp Screen 30 ton cap.

JORDANS
1—E. D. Jones Standard motor drive
1—Dillon No. 2 Motor drive
1—Appleton No. 2 motor drive
1—Noble & Wood Monarch Belt Drive
1—Emerson No. 2 Belt Drive

KNIFE GRINDER
172" Seybold automatic used one year

MISCELLANEOUS
1—Warren Broke Target with pump
2—Yankee Dryer doctor oscillators (Beloit)
2—Nugent Oil Filters (new)
2—Beloit Fourdrinier Shakes
1—Oster Pipe Threading Machine 2" to 6" direct conn. to motor

MOTORS
1—30 h.p. 600 R.P.M. 2300 V. 3 Ph. 60 cy.
1—40 H.P. 3600 R.P.M. 2300 V. 3 Ph. 60 cy.

PLATERS
2—Holyoke 2 Roll 18" dia. 36" face

PULP EQUIPMENT
2—Pusey & Jones vertical Digesters (welded) 7' dia., 24' high 125 lb. pressure
8—Horizontal Digesters 15' diam. 47' face 150 lb. pressure
3—Improved No. 2 Knotters
1—Nichols-Herreshoff Lime Kiln
1—Williams No. 30 Bark Hog
1—Sumner Disc Barker 72" dia.

PULPERS
1—Sturtevant Bale Pulper with conveyor & motors
1—Voith Pulper No. 1-20 tons cap.

PUMPS
1—Pusey & Jones 5" x 8" Stock.
1—DeLaval 6" x 6"
1—Oliziti Acid 3" Suction.
1—Warren 4800 g.p.m. 80' head
1—Frederick 600 g.p.m. 50' head (stock)
1—Midwest 6" stock pump

REELS
2—Pusey & Jones 104" face 18" dia. bowls
1—Pusey & Jones 115" face 18" dia. bowls
1—2-bowl 100" face 20" dia. bowls

SATURATOR
1—Guyton-Cumfer 5 gates

SAVEALL
1—A. D. Wood cylinder 48" dia. 60" face
1—No. 4 Bird with motor and speed reducer 15" diam. rubber couch.

SHEETER
1—100" Hamblet Duplex with Reeves Drive

SLITTERS & WINDERS
1—104" Warren two drum.
1—72" Pusey & Jones two drum.
1—140" Warren two drum.

SPEED REDUCERS
1—Philadelphia ratio 60 to 1—5 H.P.
1—Philadelphia ratio 600 to 1—2 H.P.
2—Grant ratio 7 to 1 5 H. P.
1—Oliver ratio 51 to 5.1 5 H.P.
1—Cleveland ratio 47 to 1 23 H.P.

STUFF PUMPS
2—12" x 12" Goulds triplex
8—10" x 20" Shartle triplex
1—12" x 20" Shartle triplex
1—8" x 18" Shartle triplex
1—12" x 16" Shartle triplex
1—8" x 10" Shartle triplex
1—7" x 16" Shartle duplex
1—8" x 18" Shartle duplex

SUCTION FELT ROLLS
1—Downingtown 12" diam. 106" drilled face
1—Downingtown 10" diam. 106" drilled face

VACUUM PUMPS
1—14" x 20" Connersville
1—12" x 18" Connersville

WASHERS (Beaters)
1—54" face—45" diam. with rigging
1—52" face—52" diam. with rigging

WET MACHINE
1—84" Improved three roll Hydraulic Enclosed drive (used one year)

CASH PURCHASER OF ALL TYPES OF PAPER, PULP AND CONVERTING EQUIPMENT
WANTED—THREE CYLINDER AND TWO FOURDRINIER MACHINES FOR EXPORT—ANY WIDTH

FOR SALE

1—Standard Horne Jordan with new shell and plug fillings.
1—300 lb. Valley Iron Works high speed Beater of the Holland type. A-1 condition.
1—Knowlton Spiral Core Machine complete with 36" Langston Recutter. Immediate delivery.
1—7-roll 48" wide Holyoke Super Calender Stack, complete with 50 H.P. G. E. a.c. 3 phase 60 cycle, 220 volt motor equipment. Machine in perfect condition.
1—62" Heavy Type Hudson Sharp two-shaft Center Wind Slitter and Rewinder. Very suitable for board work.
1—50" Kidder Score Cut Slitter and Rewinder.
1—84" Left Hand 4 Knife Carthage Chipper with two new sets of knives.
1—36" Camachine 44W Low Model Roll Rewinder. Complete and in good condition.
1—22 Lanneye Pulper complete with 40 H/P A.C. motor equipment. A-1 condition.
1—110" Double-Drum Waldron late type shear cut hydraulic Slitter and Rewinder.
1—Type FC International Folding Paper Box Machine Co.'s Folding and Gluing Machine. Range of sizes on folded cartons 2¾" to 16" when folded flat and 3" to 30" long.

GIBBS-BROWER COMPANY, INC.
21 East 40th St., New York 16, N. Y.
TF

FOR SALE

3 Dayton beater rolls and frames 64" x 54"
2 Noble & Wood beater rolls and frames 64" x 54"
1 Jones beater roll lava filled 57" x 60"
2 Jones beater rolls lava filled 61" x 48"
2 Noble & Wood Jordans Mammoth Jr.

SANDY HILL IRON & BRASS WORKS
Hudson Falls, N. Y.
A-16

PAPER MILL & PAPER CONVERTING EQUIPMENT FOR SALE

34" Inman Slitter.
42" Firsching Cloth Slitter.
36" Sheridan Automatic Power Paper Cutter.
44" Seybold Holyoke Aut. mill type Power Cutter.
45" White Automatic Power Cutter.
80" Finley Sheeter.
110" Hamblet heavy duty Sheeter.
68" Rice Barton & Fales Slitter & Rewinder, for use on dry end of paper machines.
120" Moore & White 4-drum Rewinder.
New 62" Two-Roll Back Stand, handling rolls up to 30" diameter.
4 Waldron 36" Paper Reelers
Baling Machines, both hand and power.

THOMAS W. HALL COMPANY, Inc.
120 West 42nd St., New York 18, N. Y.
TF

FOR SALE—One No. 97 Davidson suction feeder with ¼ H.P.D.C. Motor. Perfect condition. Bargain. Address Box 45-456 care Paper Trade Journal. A-30

FOR SALE—1 Hamilton-Corliss Variable Speed Twin Engine, size of cylinders 12" x 24" Also Triple-Deck Frames for ninety 36" dryers any width. The Chesapeake Paperboard Co. Baltimore, 30, Md. TF

FOR SALE—1—Erie Ball Engine Co. 14" x 16" horizontal duplex plain side crank steam engine, built for 160° steam pressure and 450° steam temp. First class condition. Morris Paper Mills, Morris, Illinois. A-16

FOR SALE—50" Seybold Automatic Clamp Cutter, thoroughly rebuilt and fully guaranteed. Address Box 45-486 care Paper Trade Journal. A-16

FOR SALE

New and guaranteed used steel pipe, boiler tubing, valves, fittings, wood and steel tanks, steel buildings

JOS. GREENSPON'S SON PIPE CORP.
NATIONAL STOCK YARDS, Illinois.
S-6

FOR SALE

2—63" Dietz Toilet Converters.
1—81" Dietz Toilet Converter.

J. J. ROSS COMPANY
250 Frelinghuysen Ave.
Newark 5, N. J.
Telephone Bigelow 3-3720 A-16

FOR SALE—Potdevin Machines—square and flattype—making 5 lb. and up. Address Box 45-451 care Paper Trade Journal. A-16

FOR SALE—One 72" Camachine Model 2 AL, splitting and rewinding, with additional knives and accessory parts. Less than one year old. Address Box 45-480 care Paper Trade Journal. A-16

FOR SALE—41" Hamblet Sheeter. Address Box 45-474 care Paper Trade Journal. A-16

WANTED

WANTED

By a paper converter, Hamblet or similar sheeters, 36" to 48" wide, with or without roll stands and layboys.

Address Box 45-430 care Paper Trade Journal. A-16

DIGESTERS and PRESSURE KIERS wanted on lease, or will buy plant or part of plant in good working condition with following equipment: Digesters or Pressure Kiers, preferably circulating and vertical type. Pressure to 30# or higher with liquor capacity 300 to 500 gallons minimum. Rinsing vats. Driers. Centrifuges. Preferred location in the South. Write full particulars to Box 45-457 care Paper Trade Journal. TF

WANTED—W & P Shredders, Evaporators, Generators and Boilers, Slitters, Cutters, Hydraulic Presses, Sheridan Presses, Dryers. Address Box 44-835 care Paper Trade Journal tf

WANTED

WANTED — DISCARDED PAPER MILL FELTS. HIGHEST PRICES paid for all kinds of discarded paper mill felts. LARGE or SMALL QUANTITIES accepted. Prices quoted immediately on receipt of samples. ADDRESS: GLASER AND YOFFE, INC., 80 NORTH MAIN ST., NATICK, MASS. TF

WANTED—1—36" Diameter x 90" to 93" Face Cylinder Mold. Address Box 45-461 care Paper Trade Journal. A-30

WANTED—Fourdrinier Paper Machine, 30 ton daily capacity, trim 80". Address Box 45-476 care Paper Trade Journal. A-23

WANTED—Envelope Machines. Kindly state type of machine, condition and price. Address Box 45-482 care Paper Trade Journal. A-16

WANTED—One Rag Cutter, in good condition. Hawley Products Canada Ltd., Brantford, Ontario, Canada. S-6

WANTED—Combiner to take up to 12 rolls of paper approximately 52" wide. Address Box 45-485 care Paper Trade Journal. A-16

WANTED—Brightwood Box Machine. Address Box 44-836 care Paper Trade Journal. tf

The right man may be seeking a job in an advertisement in this section.

The machine or the material you urgently need may be advertised right here in these columns. Read Them, Use Them—If you need something, advertise for it—If you have something to sell tell the industry about it—Everybody reads the Clearing House.

BLANKETS

Converted From Your Used Felts

Write for Full Details

BLOOMFIELD WOOLEN COMPANY
BLOOMFIELD, IND.

OPPORTUNITIES

CELLULOSE WADDING

Converter wishes to establish permanent mill connection for Cellulose Wadding. Immediate requirements one hundred thousand pounds monthly for civilian product with excellent prospects for doubling volume postwar. Opportunity for paper mill to convert one machine to profitable production. Advise Box No. 45-434 care Paper Trade Journal.

A-16

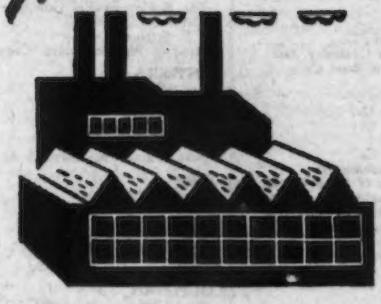
TAPPI NUMBER OF PAPER TRADE JOURNAL WILL BE PUBLISHED SEPTEMBER 27, 1945

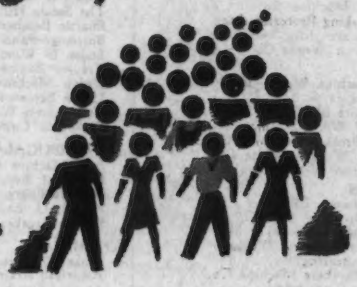
what the PAYROLL SAVINGS PLAN *means*

To you

To your Industry

and your Employees





Facts and figures prove **the Payroll Savings Plan to be a tremendous national asset. Through this plan, no less than 27,000,000 workers have so far saved more than $13½ billions to help speed victory . . . forestall inflation . . . and build peacetime prosperity!**

Did you know that yours is one of 240,000 companies maintaining a Payroll Savings Plan? Not only is this combined effort fostering national security, but also creating a lucrative postwar market for you . . . and all American industry!

Have you realized that 76% of all employed in industry are now enrolled in the Payroll Savings Plan . . . averaging a $25 bond each month per employee? Through this plan, millions are now looking forward to homes, educational opportunities and old age independence!

Surely, so great an asset to your country, your company and your employees is worthy of your continued . . . and increased . . . support! Now is the time to take stock of your Payroll Savings Plan. Use selective resolicitation to keep it at its 7th War Loan high! Keep using selective resolicitation to build it even higher!

The Treasury Department acknowledges with appreciation the publication of this message by

PAPER TRADE JOURNAL

This is an official U.S. Treasury advertisement prepared under the auspices of the Treasury Department and War Advertising Council

WHERE TO BUY

ABRASIVES
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Monsanto Chemical Co.
Norton Co.

ADHESIVES
American Resinous Chemicals Corp.
Arabol Mfg. Co.
National Adhesives Division of National Starch Products, Inc.
Philadelphia Quartz Co.
Stein, Hall & Co., Inc.
United States Rubber Co.

AGITATORS
Appleton Machine Co.
Dilts Machine Works, Inc.
Dorr Company
Downingtown Mfg. Co.
Improved Paper Machy. Corp.
E. D. Jones & Sons Co.
D. J. Murray Mfg. Co.
Montague Machine Co.
Moore & White Co.
Noble & Wood Machine Co.
H. K. Porter Company Inc.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

BAG MACHINES
Thomas W. Hall Co., Inc.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Weber, Herman G.

BARKERS AND CHIPPERS
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Carthage Machine Co.
Fibre Making Processes, Inc.
D. J. Murray Mfg. Co.
Valley Iron Works Co.

BARS
Dilts Machine Works, Inc.
E. D. Jones & Sons Co.
The Moore & White Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Simonds Worden White Co.
Valley Iron Works Co.

BEARINGS
Black-Clawson Company
Jones, E. D. & Sons Co.
The Manhattan Rubber Mfg. Co
Montague Machine Works
Rollway Bearing Co.
Shartle Brothers Machine Co
Shenango-Penn Mold Co.
SKF Industries Inc.
Timken Roller Bearing Co.
Valley Iron Works Co.
T. B. Woods' Sons Company

BEATERS & JORDANS
The Appleton Machine Co.
Black-Clawson Company
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Herman Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
J. J. Ross Company
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works

BED PLATES
Bahr Brothers Mfg. Co.
Dilts Machine Works Inc.
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Simonds Worden White Co.
Valley Iron Works Co.

BELTING
Allis-Chalmers Mfg. Co.
The Cincinnati Rubber Mfg. Co.
Graton & Knight Company
The Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
J. E. Rhoads & Sons
United States Rubber Co.
T. B. Wood's Sons Company
Worthington Pump & Machinery Corp.

BLEACHING APPARATUS
Improved Paper Machy. Corp.
E. D. Jones & Sons Co.
Perkins & Sons, Inc., B. F.
Moore & White Co.
Niagara Alkali Co.
Noble & Wood Machine Co.
Pennsylvania Salt Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

BLOW PIPES & PITS
Montague Machine Co.
Moore & White Co.
Murray Mfg. Co., D. J.
Walworth Company

BOTTOMS
Harrington & King Perforating Co.
Kalamazoo Tank & Silo Co.
Valley Iron Works Co.

BUILDERS—PAPER MILLS
Merritt-Chapman & Scott Corp.

CALENDERS
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
Lobdell Car Wheel Co.
Moore & White Co.
Black-Clawson Company
Perkins & Son, Inc., B. F.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works
Waldron Corp., John

CASEIN
Packing Products Co.

CASTINGS
Appleton Machine Co.
Black-Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Fort Pitt Steel Casting Co., Div. H. K. Porter Company, Inc.
The Frederick Iron & Steel Co.
Grinnel Company
Hamblet Machine Co.
E. D. Jones & Sons Co.
Lobdell Car Wheel Co.
Magnus Metal Corp.
Montague Machine Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Shenango-Penn Mold Co.
Smith & Winchester Mfg. Co.
Traylor Engineering & Mfg. Co.
Union Machine Company
Union Screen Plate Co.
Valley Iron Works Co.
Walworth Company

CENTRIFUGAL MACHINERY
Bird Machine Co.
De Laval Steam Turbine Co.
Nichols Engrg. & Research Corp.
Ross J. O. Eng. Co.
Shartle Brothers Machine Co.

CHEMICALS
Amer. Cyanamid & Chem. Corp.
American Resinous Chemicals Corp.
Ansul Chemical Co.
Calco Chemical Co.
Diamond Alkali o.
Dispersion Process Inc.
Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
General Dyestuff Corp.
Geigy Co., Inc.
Gottesman & Co.
Hooker Electrochemical Company
The Mathieson Alkali Works, Inc.
Monsanto Chemical Company
National Oil Products Co.
Naugatuck Chemical Div. of U. S. Rubber Co.
Niagara Alkali Company
Paper Makers Chemical Department, Hercules Powder Co.
Pennsylvania Salt Mfg. Co.
Pioneer Salt Company
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
Stauffer Chemical Company
United States Rubber Co.
Witco Chemical Co.
Wyandotte Chemicals Corp.

CLEANING MATERIALS
Amer. Cyanamid & Chem. Corp.
Bird Machine Co.
E. I. du Pont de Nemours & Co., Inc.
Paper Makers Chemical Department, Hercules Powder Co.
Magnus Chemical Co.
Nichols Engrg. & Research Corp.
Oakite Products, Inc.
Pennsylvania Salt Mfg. Co.
Philadelphia Quartz Co.
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
Wyandotte Chemicals Corp.
J. B. Ford Division

CLUTCHES
Appleton Machine Co.
Black-Clawson Company
Hudson Sharp Machine Company
Farrel-Birmingham Co.
Fawick Airflex Co., Inc
Horton Manufacturing Co
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Stearns Magnetic Mfg. Co.
Valley Iron Works Co.
T. B. Wood's Sons Company

COATING MACHINERY
Hudson Sharp Machine Company
Moore & White Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corporation, John
Weber, Herman G.

COMPRESSORS
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
Ingersoll-Rand Co.
Nash Engineering Co.
Worthington Pump & Machinery Corp.

CONSTRUCTION ENGINEERS
Merritt-Chapman & Scott Corp.

CONSULTING ENGINEERS
W. H. L. D. Betz
Frederic C. Clark
Ferguson, Hardy S.
Hardy, George F.
Johnson & Wierk, Inc.
The Kohler System Company
Main, Inc., Chas. T.
J. E. Sirrine & Co.
Stone & Webster Engrg. Corp.

CONTROLS
The Bristol Company

CONVEYORS
Black-Clawson Company
Murray, D. J. Mfg. Co.
Ross Engineering Corp., J. O.

CORES
Elizman Paper Co.
Sonoco Products Co.
Rodney Hunt Machine Co.
Montague Machine Co.
Smith & Winchester Mfg. Co.
Walker-Goulard-Plehn Co.

COUPLINGS
Black-Clawson Company
De Laval Steam Turbine Co.
Farrel-Birmingham Co., Inc.
The Frederick Iron & Steel
E. D. Jones & Sons Co.
Lovejoy Flexible Coupling Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works
Waldron Corp., John
Westinghouse Electric Corporation
T. B. Wood's Sons Company

CUTTERS
Thomas W. Hall Co.
Noble & Wood Mach. Co.
Perkins & Son, Inc., B. F.
The Smith & Winchester Mfg. Co.
Taylor Stiles & Co.

DAMPENERS
Perkins & Son, Inc., B. F.
Valley Iron Works Co.

DE-INKING
Kinsley Chemical Co.

DIGESTERS
H. K. Porter Company Inc.
Pusey & Jones Corp.

DOCTORS
Bird Machine Company
Black-Clawson Company
Downingtown Mfg. Co.
Lobdell Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DOCTOR BLADES
Black-Clawson Company
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers
United States Rubber Co.
Westinghouse Electric Corporation

DRIERS
Black-Clawson Company
Murray Mfg. Co., D. J.
J. J. Ross Company
Ross, J. O. Engineering Corp.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

DRIVES
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Bird Machine Co.
Black-Clawson Company
Davis, Frank H., Co.
De Laval Steam Turbine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
General Electric Company
Horton Manufacturing Co.
Rodney Hunt Machine Co.
Montague Machine Co.
Moore & White Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
T. B. Wood's Sons Co.
Valley Iron Works Co.
Westinghouse Electric Corporation

DUSTERS
Appleton Machine Co.
Downingtown Mfg. Co.
Fibre Making Processes, Inc.
E. D. Jones & Son Co.
Moore & White Co.
Noble & Wood Machine Co.
Norwood Engrg. Co.
D. J. Murray Mfg. Co.

DYESTUFFS
Calco Chemical Co.
Ciba Company
E. I. du Pont de Nemours & Co.
Geigy Co., The
General Dyestuff Corp.
National Aniline Division, Allied Chemical & Dye Corp.
Paper Makers Chemical Department, Hercules Powder Co.
C. K. Williams & Co.
Witco Chemical Co.

EQUIPMENT INSTALLATION
Merritt-Chapman & Scott Corp.

EVAPORATORS
Black-Clawson Company
Goslin-Birmingham Mfg. Co., Inc.
Murray, D. J., Mfg. Co.
Traylor Engineering & Mfg. Co.

FANS
General Electric Co.
B. F. Perkins & Son, Inc.
Ross Engineering Co., J. O.

FEEDERS
Builders-Providence, Inc.
Merrick Scale Mfg. Co.
Leeds & Northrup
Traylor Engineering Co
Wallace & Tiernan

FELTS
Appleton Woolen Mills
Asten-Hill Mfg. Co.
Bloomfield Woolen Co.
Bulkley, Dunton Pulp Co. Inc
Draper Bros. Corp.
Huyck & Son, F. C.
Lockport Felt Co.
Mt. Vernon-Woodbury Mills, Inc
Morey Paper Mill Supply Co.
Orr Felt & Blanket Co.
Shuler & Benninghofen
Waterbury Felt Co.
Woodward, Baldwin & Co

FELT GUIDES
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

FILLERS
American Colloid Co.
Amer. Cyanamid & Chem Corp
American Resinous Chemicals Corp.
W. H. Loomis Talc Corp
Vanderbilt Co., R. T.
Witco Chemical Co.

FILTERS
Moore & White Co.
J. O. Ross Engrg. Corp.
Worthington Pump & Mchy. Corp
Witco Chemical Co.

FLOORING, GRATING & TREADS
Hendrick Mfg. Co.
Norton Co.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
United States Rubber Co.

FORMING MACHINES
Downingtown Mfg. Co
Noble & Wood Machine Co
Oliver United Filters
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co

WHERE TO BUY

GEARS
Black-Clawson Company
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

GRINDERS
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Montague Machine Co
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Works

GRINDING WHEELS
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Simonds Worden White Co.
United States Rubber Co.

HEATING, VENTILATING AND AIR CONDITIONING
The Appleton Machine Co.
Armstrong Machine Works
Fibre Making Processes, Inc.
E. D. Jones & Sons Co.
General Electric Co.
Grinnell Company
Leeds & Northrup
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Ross Engineering Corp., J. O.
Shartle Brothers Machine Co
Valley Iron Works Co.
Worthington Pump & Mchy Corp

HOISTS
Appleton Machine Co.
Dilts Machine Works
Rodney Hunt Machine Co.
Ingersoll-Rand Co.
E. D. Jones & Sons Co.

HOSE (Air, Water, Suction, etc.)
The Cincinnati Rubber Mfg. Co.
The Manhattan Rubber Manufacturing Division of Raybestos-Manhattan Inc.
United States Rubber Co.

INSTRUMENTS, TESTING AND MEASURING
W. H. & L. D. Betz
N. P. Bowsher
The Bristol Company
Builders-Providence, Inc.
The Foxboro Company
General Electric
W. & L. E. Gurley
Leeds & Northrup Company
National Technical Laboratories
B. F. Perkins & Son
Taber Instrument Corp.
Taylor Instrument Cos
Wallace & Tiernan Co., Inc.

JORDAN FILLINGS
Appleton Machine Co.
Behr Brothers Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co
Smith & Winchester Mfg. Co
Valley Iron Works Co.

KNIVES
Black-Clawson Company
Dilts Machine Works, Inc.
Hamblet Machine Co.
E. D. Jones & Sons Co.
Simonds Worden White Co
Valley Iron Works Co.

LABORATORY EQUIPMENT
Appleton Machine Co.
W. H. & L. D. Betz
Dilts Machine Works
E. D. Jones & Sons Co.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co
Taber Instrument Co.
Taylor Instrument Companies
Valley Iron Works Co.

LAY BOYS
Hamblet Machine Co.
Moore & White Co
Shartle Brothers

LUBRICANTS
Gulf Oil Corporation
Gulf Refining Co.
Sinclair Refining Co.
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De Laval Steam Turbine Co.
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United States Rubber Co.

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Hudson Sharp Machine Company
Langston Co., Samuel M.

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Potdevin Machine Co.
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Waldron Corp., John

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Crane Company
Grinnell Company
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Walworth Company
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J. O. Ross Engrg. Corp.
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Hudson-Sharp Machine Co
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Rotogravure Engineering Co
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Weber, Homer G.

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Johnson Corp.
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Noble & Wood Machine Co.
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Hudson Sharp Machine Company
The Kohler System Company
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American Resinous Chemicals Corp.
The Resinous Products & Chemical Co.

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Noble & Wood Machine Co.
Perkins, B. F., & Sons Co.
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Shartle Brothers Machine Co.
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Sinclair Co.
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Stearns Magnetic Mfg. Co.
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Valley Iron Works Co.
Waldron Corp., John

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Youngstown Welding & Engrg. Co

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Johnstone Eng. & Machine Co.
The Kohler System Company
Moore & White Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.

ROTARY KILNS
Traylor Engineering & Mfg. Co.

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Black-Clawson Company
Moore & White Co.
Noble & Wood Machine Co
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co
Waldron Corp., John
Weber, Herman C

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Merrick Scale Mfg. Co

SCREEN PLATES
Fitchburg Screen Plate Co.
Magnus Metal Corp.
Morey Paper Mill Supply Co
Union Machine Co.
Union Screen Plate Co.

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Appleton Machine Co.
Bird Machine Company
Carthage Machine Co.
Dilts Machine Works, Inc
Downingtown Mfg. Co.
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Hendrick Manufacturing Co
E. D. Jones & Sons Co.
Montague Machine Co.
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J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co
Traylor Engineering & Mfg Co.
Valley Iron Works Co.

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The Hermann Manufacturing Co
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Rotogravure Engrg. Co
Valley Iron Works Co.

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Moore & White Co.
Shartle Bros. Mach. Co.
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Carthage Machine Co.

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The Dow Chemical Co.
du Pont, E. I., de Nemours & Co
National Oil Products Co
Paper Makers Chemical Department Hercules Powder Co.
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Socony-Vacuum Co.
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Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co
Valley Iron Works Co
Waldron Corp., John

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The Spray Engineering Co.

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Eastern Stainless Steel Corp.
Industrial Steels, Inc.

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Clinton Co.
National Starch Products, Inc
Stein, Hall & Co., Inc.

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Shartle Bros. Mch. Co.
Stickle Steam Specialties Co.

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The Stanley Works

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The Sandy Hill Iron & Brass Works
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Westinghouse Electric Corp.

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American Cyanamid & Chemical Corp.
Stauffer Chemical Company
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Witco Chemical Company

SULPHUR BURNERS
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The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
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Shartle Brothers Machine Co.

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Waldron Corp., John
Youngstown Welding & Engrg. Co

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Dilts Machine Works
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Montague Machine Co.
Moore & White Co.
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J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
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Grinnel Company
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Noble & Wood Machine Co
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Weber, Herman G.

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Downingtown Mfg. Co.
Moore & White Co.
Montague Machine Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co
Valley Iron Works Co.

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Dietz Machine Works
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Hudson-Sharp Mach. Co.
Langston Co., Samuel M.
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The Kobler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Potdevin Machine Co.
Pusey & Jones Corp.
Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Waldron Corp., John

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Appleton Wire Works
Black-Clawson Company
Bulkley, Dunton Pulp Co. Inc.
Cheney Bigelow Wire Works
Hayden Wire Works
International Wire Works
Lindsay Wire Weaving Co.
Shartle Brothers Machine Co.

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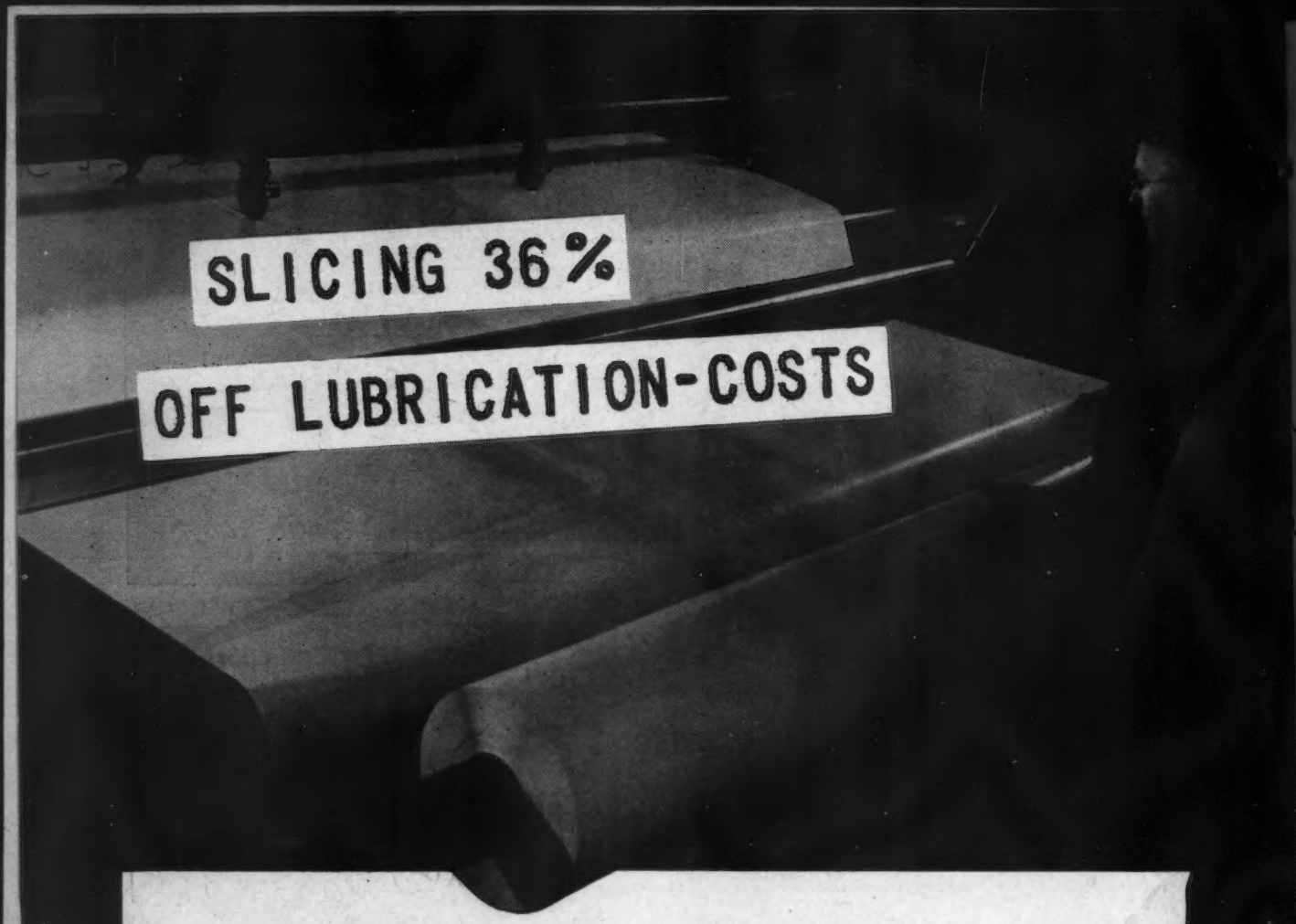

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